<html> <html xmlns="http://www.w3.org/1999/xhtml"><head><meta http-equiv="Content-Type" content="text/html; charset=UTF-8"><title>Zotero Report</title><link rel="stylesheet" type="text/css" href="Zotero%20Report_files/detail.css"><link rel="stylesheet" type="text/css" media="screen,projection" href="Zotero%20Report_files/detail_screen.css"><link rel="stylesheet" type="text/css" media="print" href="Zotero%20Report_files/detail_print.css"></head><body><ul class="report combineChildItems"><li id="item-15352" class="item journalArticle"><h2>*Brodmann's areas 17 and 18 brought into stereotaxic space-where and how variable?*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>K Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>A Malikovic</td></tr><tr class="creator author"><th class="author">Author</th><td>H Mohlberg</td></tr><tr class="creator author"><th class="author">Author</th><td>T Schormann</td></tr><tr class="creator author"><th class="author">Author</th><td>K Zilles</td></tr><tr class="volume"><th class="volume">Volume</th><td>11</td></tr><tr class="issue"><th class="issue">Issue</th><td>1</td></tr><tr class="pages"><th class="pages">Pages</th><td>66-84</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>Jan 2000</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1006/nimg.1999.0516</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Studies on structural-functional associations in the visual system require precise information on the location and variability of Brodmann's areas 17 and 18. Usually, these studies are based on the Talairach atlas, which does not rely on cytoarchitectonic observations, but on comparisons of macroscopic features in the Talairach brain and Brodmann's drawing. In addition, in this atlas are found only the approximate positions of cytoarchitectonic areas and not the exact borders. We have cytoarchitectonically mapped both areas in 10 human brains and marked their borders in corresponding computerized images. Borders were defined on the basis of quantitative cytoarchitecture and multivariate statistics. In addition to borders of areas 17 and 18, subparcellations within both areas were found. The cytoarchitectonically defined areas were 3-D reconstructed and transferred into the stereotaxic space of the standard reference brain. Surface rendering of the brains revealed high individual variability in size and shape of the areas and in the relationship to the free surface and sulci. Ranges and centers of gravity of both areas were calculated in Talairach coordinates. The positions of areas 17 and 18 in the stereotaxic space differed between the hemispheres. Both areas reached significantly more caudal and medial positions on the left than on the right. Probability maps were created in which the degree of overlap in each stereotaxic position was quantified. These maps of areas 17 and 18 are the first of their kind and contain precise stereotaxic information on both interhemispheric and interindividual differences.*</td></tr></tbody></table>
<li id="item-15347" class="item journalArticle"><h2>Correlated size variations in human visual cortex, lateral geniculate nucleus, and optic tract</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>T J Andrews</td></tr><tr class="creator author"><th class="author">Author</th><td>S D Halpern</td></tr><tr class="creator author"><th class="author">Author</th><td>D Purves</td></tr><tr class="volume"><th class="volume">Volume</th><td>17</td></tr><tr class="issue"><th class="issue">Issue</th><td>8</td></tr><tr class="pages"><th class="pages">Pages</th><td>2859-2868</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of neuroscience: the official journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Apr 15, 1997</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>We have

examined several components of the human visual system to determine how the dimensions of the optic tract, lateral geniculate nucleus (LGN), and primary visual cortex (V1) vary within the same brain. Measurements were made of the cross-sectional area of the optic tract, the volumes of the magnocellular and parvocellular layers of the LGN, and the surface area and volume of V1 in one or both cerebral hemispheres of 15 neurologically normal human brains obtained at autopsy. Consistent with previous observations, there was a two- to threefold variation in the size of each of these visual components among the individuals studied. Importantly, this variation was coordinated within the visual system of any one individual. That is, a relatively large V1 was associated with a commensurately large LGN and optic tract, whereas a relatively small V1 was associated with a commensurately smaller LGN and optic tract. This relationship among the components of the human visual system indicates that the development of its different parts is interdependent. Such coordinated variation should generate substantial differences in visual ability among humans.</td></tr></tbody></table>
<li id="item-6522" class="item journalArticle"><h2>*Retinotopic organization of human ventral visual cortex*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Michael J Arcaro</td></tr><tr class="creator author"><th class="author">Author</th><td>Stephanie A McMains</td></tr><tr class="creator author"><th class="author">Author</th><td>Benjamin D Singer</td></tr><tr class="creator author"><th class="author">Author</th><td>Sabine Kastner</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19710316</td></tr><tr class="volume"><th class="volume">Volume</th><td>29</td></tr><tr class="issue"><th class="issue">Issue</th><td>34</td></tr><tr class="pages"><th class="pages">Pages</th><td>10638-10652</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience: The Official Journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Aug 26, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.2807-09.2009</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Functional magnetic resonance imaging studies have shown that human ventral visual cortex anterior to human visual area V4 contains two visual field maps, VO-1 and VO-2, that together form the ventral occipital (VO) cluster (Brewer et al., 2005). This cluster is characterized by common functional response properties and responds preferentially to color and object stimuli. Here, we confirm the topographic and functional characteristics of the VO cluster and describe two new visual field maps that are located anterior to VO-2 extending across the collateral sulcus into the posterior parahippocampal cortex (PHC). We refer to these visual field maps as parahippocampal areas PHC-1 and PHC-2. Each PHC map contains a topographic representation of contralateral visual space. The polar angle representation in PHC-1 extends from regions near the lower vertical meridian (that is the shared border with VO-2) to those close to the upper vertical meridian (that is the shared border with PHC-2). The polar angle representation in PHC-2 is a mirror reversal of the PHC-1 representation. PHC-1 and PHC-2 share a foveal representation and show a strong bias toward representations of peripheral eccentricities. Both the foveal and peripheral representations of PHC-1 and PHC-2 respond more strongly to scenes than to objects or faces, with greater scene preference in PHC-2 than PHC-1. Importantly, both areas heavily overlap with the functionally defined parahippocampal place area. Our results suggest that ventral visual cortex can be subdivided on the basis of topographic criteria into a greater number of discrete maps than previously thought.</td></tr></tbody></table>
<li id="item-10881" class="item journalArticle"><h2><a

*href=“zotero:*select/items/0_ZVM5KKHF”>The retinotopic organization of striate cortex is well predicted by surface topology</h2><table><tbody><tr class=“creator author”><th class=“author”>Author</th><td>Noah C Benson</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>Omar H Butt</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>Ritobrato Datta</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>Petya D Radoeva</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>David H Brainard</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>Geoffrey K Aguirre</td></tr><tr class=“volume”><th class=“volume”>Volume</th><td>22</td></tr><tr class=“issue”><th class=“issue”>Issue</th><td>21</td></tr><tr class=“pages”><th class=“pages”>Pages</th><td>2081-2085</td></tr><tr class=“publicationTitle”><th class=“publicationTitle”>Publication</th><td>Current biology: CB</td></tr><tr class=“date”><th class=“date”>Date</th><td>Nov 6, 2012</td></tr><tr class=“DOI”><th class=“DOI”>DOI</th><td>10.1016/j.cub.2012.09.014</td></tr><tr class=“abstractNote”><th class=“abstractNote”>Abstract</th><td>In 1918, Gordon Holmes combined observations of visual-field scotomas across brain-lesioned soldiers to produce a schematic map of the projection of the visual field upon the striate cortex. One limit to the precision of his result, and the mapping of anatomy to retinotopy generally, is the substantial individual variation in the size, volumetric position, and cortical magnification of area V1. When viewed within the context of the curvature of the cortical surface, however, the boundaries of striate cortex fall at a consistent location across individuals. We asked whether the surface topology of the human brain can be used to accurately predict the internal, retinotopic function of striate cortex as well. We used fMRI to measure polar angle and eccentricity in 25 participants and combined their maps within a left-right, transform-symmetric representation of the cortical surface. These data were then fit using a deterministic, algebraic model of visual-field representation. We found that an anatomical image alone can be used to predict the retinotopic organization of striate cortex for an individual with accuracy equivalent to 10-25 min of functional mapping. This indicates tight developmental linkage of structure and function within a primary, sensory cortical area.</td></tr></tbody></table>
<li id=“item-8594” class=“item journalArticle”><h2>Spatial attention improves reliability of fMRI retinotopic mapping signals in occipital and parietal cortex</h2><table><tbody><tr class=“creator author”><th class=“author”>Author</th><td>David W Bressler</td></tr><tr class=“creator author”><th class=“author”>Author</th><td>Michael A Silver</td></tr><tr class=“url”><th class=“url”>URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/20600961</td></tr><tr class=“volume”><th class=“volume”>Volume</th><td>53</td></tr><tr class=“issue”><th class=“issue”>Issue</th><td>2</td></tr><tr class=“pages”><th class=“pages”>Pages</th><td>526-533</td></tr><tr class=“publicationTitle”><th class=“publicationTitle”>Publication</th><td>NeuroImage</td></tr><tr class=“date”><th class=“date”>Date</th><td>Nov 1, 2010</td></tr><tr class=“DOI”><th class=“DOI”>DOI</th><td>10.1016/j.neuroimage.2010.06.063</td></tr><tr class=“abstractNote”><th class=“abstractNote”>Abstract</th><td>Spatial attention improves visual perception and increases the amplitude of neural responses in visual cortex. In addition, spatial attention tasks and fMRI have been used to discover topographic visual field representations in regions outside visual cortex. We therefore hypothesized that requiring subjects to attend to a retinotopic mapping stimulus would facilitate the characterization of visual field representations in a number of cortical areas. In our study, subjects attended either a central fixation point or a wedge-shaped stimulus

*that rotated about the fixation point. Response reliability was assessed by computing coherence between the fMRI time series and a sinusoid with the same frequency as the rotating wedge stimulus. When subjects attended to the rotating wedge instead of ignoring it, the reliability of retinotopic mapping signals increased by approximately 50% in early visual cortical areas (V1, V2, V3, V3A/B, V4) and ventral occipital cortex (VO1) and by approximately 75% in lateral occipital (LO1, LO2) and posterior parietal (IPS0, IPS1, IPS2) cortical areas. Additionally, one 5-min run of retinotopic mapping in the attention-to-wedge condition produced responses as reliable as the average of three to five (early visual cortex) or more than five (lateral occipital, ventral occipital, and posterior parietal cortex) attention-to-fixation runs. These results demonstrate that allocating attention to the retinotopic mapping stimulus substantially reduces the amount of scanning time needed to determine the visual field representations in occipital and parietal topographic cortical areas. Attention significantly increased response reliability in every cortical area we examined and may therefore be a general mechanism for improving the fidelity of neural representations of sensory stimuli at multiple levels of the cortical processing hierarchy.</td></tr></tbody></table>
<li id="item-8111" class="item journalArticle"><h2>Visual field maps and stimulus selectivity in human ventral occipital cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Alyssa A Brewer</td></tr><tr class="creator author"><th class="author">Author</th><td>Junjie Liu</td></tr><tr class="creator author"><th class="author">Author</th><td>Alex R Wade</td></tr><tr class="creator author"><th class="author">Author</th><td>Brian A Wandell</td></tr><tr class="volume"><th class="volume">Volume</th><td>8</td></tr><tr class="issue"><th class="issue">Issue</th><td>8</td></tr><tr class="pages"><th class="pages">Pages</th><td>1102-9</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Nature Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Aug 2005</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>nn1507</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Human visual cortex is organized into distinct visual field maps whose locations and properties provide important information about visual computations. There are two conflicting models of the organization and computational role of ventral occipital visual field maps. We report new functional MRI measurements that test these models. We also present the first coordinated measurements of visual field maps and stimulus responsivity to color, objects and faces in ventral occipital cortex. These measurements support a model that includes a hemifield map, hV4, adjacent to the central field representation of ventral V3. In addition, the measurements demonstrate a cluster of visual field maps in ventral occipital cortex (VO cluster) anterior to hV4. We describe the organization and stimulus responsivity of two new hemifield maps, VO-1 and VO-2, within this cluster. The maps and stimulus responsivity support a general organization of visual cortex based on clusters of maps that serve distinct computational functions.</td></tr></tbody></table>
<li id="item-5858" class="item journalArticle"><h2>Auditory Attention Activates Peripheral Visual Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Anthony D. Cate</td></tr><tr class="creator author"><th class="author">Author</th><td>Timothy J. Herron</td></tr><tr class="creator author"><th class="author">Author</th><td>E. William Yund</td></tr><tr class="creator author"><th class="author">Author</th><td>G. Christopher Stecker</td></tr><tr class="creator author"><th class="author">Author</th><td>Teemu Rinne</td></tr><tr class="creator author"><th class="author">Author</th><td>Xiaojian Kang</td></tr><tr class="creator author"><th*

*class="author">Author</th><td>Christopher I. Petkov</td></tr><tr class="creator author"><th class="author">Author</th><td>Elizabeth A. Disbrow</td></tr><tr class="creator author"><th class="author">Author</th><td>David L. Woods</td></tr><tr class="url"><th class="url">URL</th><td>http://dx.doi.org/10.1371%2Fjournal.pone.0004645</td></tr><tr class="volume"><th class="volume">Volume</th><td>4</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th class="pages">Pages</th><td>e4645</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>PLoS ONE</td></tr><tr class="date"><th class="date">Date</th><td>February 27, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1371%2Fjournal.pone.0004645</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Recent neuroimaging studies have revealed that putatively unimodal regions of visual cortex can be activated during auditory tasks in sighted as well as in blind subjects. However, the task determinants and functional significance of auditory occipital activations (AOAs) remains unclear. We examined AOAs in an intermodal selective attention task to distinguish whether they were stimulus-bound or recruited by higher-level cognitive operations associated with auditory attention. Cortical surface mapping showed that auditory occipital activations were localized to retinotopic visual cortex subserving the far peripheral visual field. AOAs depended strictly on the sustained engagement of auditory attention and were enhanced in more difficult listening conditions. In contrast, unattended sounds produced no AOAs regardless of their intensity, spatial location, or frequency. Auditory attention, but not passive exposure to sounds, routinely activated peripheral regions of visual cortex when subjects attended to sound sources outside the visual field. Functional connections between auditory cortex and visual cortex subserving the peripheral visual field appear to underlie the generation of AOAs, which may reflect the priming of visual regions to process soon-to-appear objects associated with unseen sound sources.</td></tr></tbody></table>
<li id="item-15355" class="item journalArticle"><h2>Visual field representations and locations of visual areas V1/2/3 in human visual cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Robert F. Dougherty</td></tr><tr class="creator author"><th class="author">Author</th><td>Volker M. Koch</td></tr><tr class="creator author"><th class="author">Author</th><td>Alyssa A. Brewer</td></tr><tr class="creator author"><th class="author">Author</th><td>Bernd Fischer</td></tr><tr class="creator author"><th class="author">Author</th><td>Jan Modersitzki</td></tr><tr class="creator author"><th class="author">Author</th><td>Brian A. Wandell</td></tr><tr class="url"><th class="url">URL</th><td>http://www.journalofvision.org/content/3/10/1</td></tr><tr class="volume"><th class="volume">Volume</th><td>3</td></tr><tr class="issue"><th class="issue">Issue</th><td>10</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Journal of Vision</td></tr><tr class="date"><th class="date">Date</th><td>10/24/2003</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1167/3.10.1</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The position, surface area and visual field representation of human visual areas V1, V2 and V3 were measured using fMRI in 7 subjects (14 hemispheres). Cortical visual field maps of the central 12 deg were measured using rotating wedge and expanding ring stimuli. The boundaries between areas were identified using an automated procedure to fit an atlas of the expected visual field map to the data. All position and surface area measurements were made along the*

boundary between white matter and gray matter. The representation of the central 2 deg of visual field in areas V1, V2, V3 and hV4 spans about 2100 mm2 and is centered on the lateral-ventral aspect of the occipital lobes at Talairach coordinates −29, −78, −11 and 25, −80, −9. The mean area between the 2-deg and 12-deg eccentricities for the primary visual areas was: V1: 1470 mm2; V2: 1115 mm2; and V3: 819 mm2. The sizes of areas V1, V2 and V3 varied by about a factor of 2.5 across individuals; the sizes of V1 and V2 are significantly correlated within individuals, but there is a very low correlation between V1 and V3. These in vivo measurements of normal human retinotopic visual areas can be used as a reference for comparison to unusual cases involving developmental plasticity, recovery from injury, identifying homology with animal models, or analyzing the computational resources available within the visual pathways.</td></tr></tbody></table>
<li id="item-3033" class="item journalArticle"><h2>Parcellations and Hemispheric Asymmetries of Human Cerebral Cortex Analyzed on Surface-Based Atlases</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>David C. Van Essen</td></tr><tr class="creator author"><th class="author">Author</th><td>Matthew F. Glasser</td></tr><tr class="creator author"><th class="author">Author</th><td>Donna L. Dierker</td></tr><tr class="creator author"><th class="author">Author</th><td>John Harwell</td></tr><tr class="creator author"><th class="author">Author</th><td>Timothy Coalson</td></tr><tr class="url"><th class="url">URL</th><td>http://cercor.oxfordjournals.org/content/22/10/2241</td></tr><tr class="volume"><th class="volume">Volume</th><td>22</td></tr><tr class="issue"><th class="issue">Issue</th><td>10</td></tr><tr class="pages"><th class="pages">Pages</th><td>2241-2262</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral Cortex</td></tr><tr class="date"><th class="date">Date</th><td>10/01/2012</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bhr291</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>We report on surface-based analyses that enhance our understanding of human cortical organization, including its convolutions and its parcellation into many distinct areas. The surface area of human neocortex averages 973 cm2 per hemisphere, based on cortical midthickness surfaces of 2 cohorts of subjects. We implemented a method to register individual subjects to a hybrid version of the FreeSurfer "fsaverage" atlas whose left and right hemispheres are in precise geographic correspondence. Cortical folding patterns in the resultant population-average "fs_LR" midthickness surfaces are remarkably similar in the left and right hemispheres, even in regions showing significant asymmetry in 3D position. Both hemispheres are equal in average surface area, but hotspots of surface area asymmetry are present in the Sylvian Fissure and elsewhere, together with a broad pattern of asymmetries that are significant though small in magnitude. Multiple cortical parcellation schemes registered to the human atlas provide valuable reference data sets for comparisons with other studies. Identified cortical areas vary in size by more than 2 orders of magnitude. The total number of human neocortical areas is estimated to be ~150 to 200 areas per hemisphere, which is modestly larger than a recent estimate for the macaque.</td></tr></tbody></table>
<li id="item-3988" class="item journalArticle"><h2>Cortical Folding Patterns and Predicting Cytoarchitecture</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Bruce Fischl</td></tr><tr class="creator author"><th class="author">Author</th><td>Niranjini Rajendran</td></tr><tr class="creator author"><th

class="author">Author</th><td>Evelina Busa</td></tr><tr class="creator author"><th class="author">Author</th><td>Jean Augustinack</td></tr><tr class="creator author"><th class="author">Author</th><td>Oliver Hinds</td></tr><tr class="creator author"><th class="author">Author</th><td>B.T. Thomas Yeo</td></tr><tr class="creator author"><th class="author">Author</th><td>Hartmut Mohlberg</td></tr><tr class="creator author"><th class="author">Author</th><td>Katrin Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>Karl Zilles</td></tr><tr class="url"><th class="url">URL</th><td>http://cercor.oxfordjournals.org/content/18/8/1973.abstract</td></tr><tr class="volume"><th class="volume">Volume</th><td>18</td></tr><tr class="issue"><th class="issue">Issue</th><td>8</td></tr><tr class="pages"><th class="pages">Pages</th><td>1973 -1980</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral Cortex</td></tr><tr class="date"><th class="date">Date</th><td>2008</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bhm225</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The human cerebral cortex is made up of a mosaic of structural areas, frequently referred to as Brodmann areas (BAs). Despite the widespread use of cortical folding patterns to perform ad hoc estimations of the locations of the BAs, little is understood regarding 1) how variable the position of a given BA is with respect to the folds, 2) whether the location of some BAs is more variable than others, and 3) whether the variability is related to the level of a BA in a putative cortical hierarchy. We use whole-brain histology of 10 postmortem human brains and surface-based analysis to test how well the folds predict the locations of the BAs. We show that higher order cortical areas exhibit more variability than primary and secondary areas and that the folds are much better predictors of the BAs than had been previously thought. These results further highlight the significance of cortical folding patterns and suggest a common mechanism for the development of the folds and the cytoarchitectonic fields.</td></tr></tbody></table>
<li id="item-5824" class="item journalArticle"><h2>*Maps of visual space in human occipital cortex are retinotopic, not spatiotopic*</h2><table><tbody><tr *class="creator author"><th class="author">Author</th><td>Justin L Gardner</td></tr><tr class="creator author"><th class="author">Author</th><td>Elisha P Merriam</td></tr><tr class="creator author"><th class="author">Author</th><td>J Anthony Movshon</td></tr><tr class="creator author"><th class="author">Author</th><td>David J Heeger</td></tr><tr class="volume"><th class="volume">Volume</th><td>28</td></tr><tr class="issue"><th class="issue">Issue</th><td>15</td></tr><tr class="pages"><th class="pages">Pages</th><td>3988-99</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience: The Official Journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Apr 9, 2008</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>28/15/3988</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>We experience the visual world as phenomenally invariant to eye position, but almost all cortical maps of visual space in monkeys use a retinotopic reference frame, that is, the cortical representation of a point in the visual world is different across eye positions. It was recently reported that human cortical area MT (unlike monkey MT) represents stimuli in a reference frame linked to the position of stimuli in space, a "spatiotopic" reference frame. We used visuotopic mapping with blood oxygen level-dependent functional magnetic resonance imaging signals to define 12 human visual cortical areas, and then determined whether the reference frame in each area was spatiotopic or retinotopic. We found that all 12 areas, including MT, represented stimuli in a retinotopic

*reference frame. Although there were patches of cortex in and around these visual areas that were ostensibly spatiotopic, none of these patches exhibited reliable stimulus-evoked responses. We conclude that the early, visuotopically organized visual cortical areas in the human brain (like their counterparts in the monkey brain) represent stimuli in a retinotopic reference frame.</td></tr></tbody></table>
<li id="item-15483" class="item journalArticle"><h2>Mapping Human Cortical Areas In Vivo Based on Myelin Content as Revealed by T1- and T2-Weighted MRI</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Matthew F. Glasser</td></tr><tr class="creator author"><th class="author">Author</th><td>David C. Van Essen</td></tr><tr class="url"><th class="url">URL</th><td>http://www.jneurosci.org/content/31/32/11597</td></tr><tr class="volume"><th class="volume">Volume</th><td>31</td></tr><tr class="issue"><th class="issue">Issue</th><td>32</td></tr><tr class="pages"><th class="pages">Pages</th><td>11597-11616</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>08/10/2011</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.2180-11.2011</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Noninvasively mapping the layout of cortical areas in humans is a continuing challenge for neuroscience. We present a new method of mapping cortical areas based on myelin content as revealed by T1-weighted (T1w) and T2-weighted (T2w) MRI. The method is generalizable across different 3T scanners and pulse sequences. We use the ratio of T1w/T2w image intensities to eliminate the MR-related image intensity bias and enhance the contrast to noise ratio for myelin. Data from each subject were mapped to the cortical surface and aligned across individuals using surface-based registration. The spatial gradient of the group average myelin map provides an observer-independent measure of sharp transitions in myelin content across the surface—i.e., putative cortical areal borders. We found excellent agreement between the gradients of the myelin maps and the gradients of published probabilistic cytoarchitectonically defined cortical areas that were registered to the same surface-based atlas. For other cortical regions, we used published anatomical and functional information to make putative identifications of dozens of cortical areas or candidate areas. In general, primary and early unimodal association cortices are heavily myelinated and higher, multimodal, association cortices are more lightly myelinated, but there are notable exceptions in the literature that are confirmed by our results. The overall pattern in the myelin maps also has important correlations with the developmental onset of subcortical white matter myelination, evolutionary cortical areal expansion in humans compared with macaques, postnatal cortical expansion in humans, and maps of neuronal density in non-human primates.</td></tr></tbody></table>
<li id="item-17210" class="item journalArticle"><h2>The subparietal and parietooccipital sulci: An anatomical study</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Bora Gürer</td></tr><tr class="creator author"><th class="author">Author</th><td>Melih Bozkurt</td></tr><tr class="creator author"><th class="author">Author</th><td>Gabriel Neves</td></tr><tr class="creator author"><th class="author">Author</th><td>Ulaş Cikla</td></tr><tr class="creator author"><th class="author">Author</th><td>Tomer Hananya</td></tr><tr class="creator author"><th class="author">Author</th><td>Veysel Antar</td></tr><tr class="creator author"><th class="author">Author</th><td>Shahriar Salamat</td></tr><tr class="creator author"><th class="author">Author</th><td>Mustafa K. Başkaya</td></tr><tr class="url"><th*

*class="url">URL</th><td>http://onlinelibrary.wiley.com/doi/10.1002/ca.22277/abstract</td></tr><tr class="volume"><th class="volume">Volume</th><td>26</td></tr><tr class="issue"><th class="issue">Issue</th><td>6</td></tr><tr class="pages"><th class="pages">Pages</th><td>667–674</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Clinical Anatomy</td></tr><tr class="date"><th class="date">Date</th><td>2013</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1002/ca.22277</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The subparietal and parietooccipital sulci are both located on the medial surface of the brain. Both of these sulci reveal significant variability in pattern and complexity. Both subparietal and parietooccipital sulci play an important role as surgical landmarks using posterior interhemispheric parietooccipital approach to lesions located adjacent to the ventricular trigon deep to the cingulate gyrus. The aim of this study is to analyze variations in the patterns of the subparietal and parietooccipital sulci and to emphasize their surgical importance. Fifty-six formalin-fixed cadaveric cerebral hemispheres from 28 adult humans are examined. Subparietal and parietal sulci patterns, variations and their relationship with the cingulate sulcus are studied according to the terminology introduced by Ono et al. The H-pattern was observed in 50% (n = 28) of all hemispheres, being the most common pattern of the subparietal sulcus. The Straight pattern was observed in the 30.4% (n = 17) of all hemispheres, being the most common pattern of the parietooccipital sulcus. Furthermore, more detailed results among the patterns, connections, side branches and the relationship with the adjacent sulci are given. Our study further confirms the complexities in the patterns of the subparietal and parietooccipital sulci and demonstrates that these sulci fall within an expected range of variations. Better knowledge of these variations will further help neurosurgeons to navigate easily during approaches involving the medial surface of the parietal lobe. Clin. Anat. 26:667–674, 2013. © 2013 Wiley Periodicals, Inc.</td></tr></tbody></table>
<li id="item-16362" class="item journalArticle"><h2>Topographic organization in and near human visual area V4</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Kathleen A Hansen</td></tr><tr class="creator author"><th class="author">Author</th><td>Kendrick N Kay</td></tr><tr class="creator author"><th class="author">Author</th><td>Jack L Gallant</td></tr><tr class="volume"><th class="volume">Volume</th><td>27</td></tr><tr class="issue"><th class="issue">Issue</th><td>44</td></tr><tr class="pages"><th class="pages">Pages</th><td>11896-11911</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of neuroscience: the official journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Oct 31, 2007</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.2991-07.2007</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The existence and location of a human counterpart of macaque visual area V4 are disputed. To resolve this issue, we used functional magnetic resonance imaging to obtain topographic maps from human subjects, using visual stimuli and tasks designed to maximize accuracy of topographic maps of the fovea and parafovea and to measure the effects of attention on topographic maps. We identified multiple topographic transitions, each clearly visible in > or = 75% of the maps, that we interpret as boundaries of distinct cortical regions. We call two of these regions dorsal V4 and ventral V4 (together comprising human area V4) because they share several defining characteristics with the macaque regions V4d and V4v (which together comprise macaque area V4). Ventral V4 is adjacent to V3v, and dorsal V4 is adjacent to parafoveal V3d. Ventral V4*

and dorsal V4 meet in the foveal confluence shared by V1, V2, and V3. Ventral V4 and dorsal V4 represent complementary regions of the visual field, because ventral V4 represents the upper field and a subregion of the lower field, whereas dorsal V4 represents lower-field locations that are not represented by ventral V4. Finally, attentional modulation of spatial tuning is similar across dorsal and ventral V4, but attention has a smaller effect in V3d and V3v and a larger effect in a neighboring lateral occipital region.</td></tr></tbody></table>
<li id="item-5924" class="item journalArticle"><h2>*Structure–function spatial covariance in the human visual cortex*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>*M K Hasnain*</td></tr><tr class="creator author"><th class="author">Author</th><td>*P T Fox*</td></tr><tr class="creator author"><th class="author">Author</th><td>*M G Woldorff*</td></tr><tr class="url"><th class="url">URL</th><td>*http://www.ncbi.nlm.nih.gov/pubmed/11459760*</td></tr><tr class="volume"><th class="volume">Volume</th><td>*11*</td></tr><tr class="issue"><th class="issue">Issue</th><td>*8*</td></tr><tr class="pages"><th class="pages">Pages</th><td>*702-716*</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>*Cerebral Cortex (New York, N.Y.: 1991)*</td></tr><tr class="date"><th class="date">Date</th><td>*Aug 2001*</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*The value of sulcal landmarks for predicting functional areas was quantitatively examined. Medial occipital sulci were identified using anatomical magnetic resonance images to create individual cortical-surface models. Functional visual areas were identified using retinotopically organized visual stimuli, and positron emission tomography subtraction imaging with intra-subject averaging. Functional areas were assigned labels by placement along the cortical surface from V1. Structure-function spatial covariances between sulci and functional areas, and spatial covariances among functional areas, were determined by projecting sulcal landmarks and functional areas into a standardized stereotaxic space and computing the 'r' statistics. A functional area was considered to spatially covary with a sulcus or another functional area if their geometric centers correlated significantly (P < 0.05) in two or more axes. Statistically significant spatial covariances were found for some, but not all comparisons. The finding of significant spatial covariances within a standardized stereotaxic space indicates that nine-parameter spatial normalization does not account for all the predictive value of structural or functional locations, and may be improved upon by using selected sulcal and functional landmarks. The present findings quantify for the first time the strength of structure–function spatial covariance and comment directly on developmental theories addressing the etiology of structure–function correspondence.*</td></tr></tbody></table>
<li id="item-15460" class="item journalArticle"><h2>Retinotopic maps, spatial tuning, and locations of human visual areas in surface coordinates characterized with multifocal and blocked FMRI designs</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Linda Henriksson</td></tr><tr class="creator author"><th class="author">Author</th><td>Juha Karvonen</td></tr><tr class="creator author"><th class="author">Author</th><td>Niina Salminen-Vaparanta</td></tr><tr class="creator author"><th class="author">Author</th><td>Henry Railo</td></tr><tr class="creator author"><th class="author">Author</th><td>Simo Vanni</td></tr><tr class="volume"><th class="volume">Volume</th><td>7</td></tr><tr class="issue"><th class="issue">Issue</th><td>5</td></tr><tr class="pages"><th class="pages">Pages</th><td>e36859</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>PloS one</td></tr><tr class="date"><th class="date">Date</th><td>2012</td></tr><tr class="DOI"><th class="DOI">DOI</th><td><a

href="http://doi.org/10.1371/journal.pone.0036859">10.1371/journal.pone.0036859</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The localization of visual areas in the human cortex is typically based on mapping the retinotopic organization with functional magnetic resonance imaging (fMRI). The most common approach is to encode the response phase for a slowly moving visual stimulus and to present the result on an individual's reconstructed cortical surface. The main aims of this study were to develop complementary general linear model (GLM)-based retinotopic mapping methods and to characterize the inter-individual variability of the visual area positions on the cortical surface. We studied 15 subjects with two methods: a 24-region multifocal checkerboard stimulus and a blocked presentation of object stimuli at different visual field locations. The retinotopic maps were based on weighted averaging of the GLM parameter estimates for the stimulus regions. In addition to localizing visual areas, both methods could be used to localize multiple retinotopic regions-of-interest. The two methods yielded consistent retinotopic maps in the visual areas V1, V2, V3, hV4, and V3AB. In the higher-level areas IPS0, VO1, LO1, LO2, TO1, and TO2, retinotopy could only be mapped with the blocked stimulus presentation. The gradual widening of spatial tuning and an increase in the responses to stimuli in the ipsilateral visual field along the hierarchy of visual areas likely reflected the increase in the average receptive field size. Finally, after registration to Freesurfer's surface-based atlas of the human cerebral cortex, we calculated the mean and variability of the visual area positions in the spherical surface-based coordinate system and generated probability maps of the visual areas on the average cortical surface. The inter-individual variability in the area locations decreased when the midpoints were calculated along the spherical cortical surface compared with volumetric coordinates. These results can facilitate both analysis of individual functional anatomy and comparisons of visual cortex topology across studies.</td></tr></tbody></table>
<li id="item-2966" class="item journalArticle"><h2>*Accurate prediction of V1 location from cortical folds in a surface coordinate system*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Oliver P Hinds</td></tr><tr class="creator author"><th class="author">Author</th><td>Niranjini Rajendran</td></tr><tr class="creator author"><th class="author">Author</th><td>Jonathan R Polimeni</td></tr><tr class="creator author"><th class="author">Author</th><td>Jean C Augustinack</td></tr><tr class="creator author"><th class="author">Author</th><td>Graham Wiggins</td></tr><tr class="creator author"><th class="author">Author</th><td>Lawrence L Wald</td></tr><tr class="creator author"><th class="author">Author</th><td>H Diana Rosas</td></tr><tr class="creator author"><th class="author">Author</th><td>Andreas Potthast</td></tr><tr class="creator author"><th class="author">Author</th><td>Eric L Schwartz</td></tr><tr class="creator author"><th class="author">Author</th><td>Bruce Fischl</td></tr><tr class="volume"><th class="volume">Volume</th><td>39</td></tr><tr class="issue"><th class="issue">Issue</th><td>4</td></tr><tr class="pages"><th class="pages">Pages</th><td>1585-1599</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>Feb 15, 2008</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuroimage.2007.10.033</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Previous studies demonstrated substantial variability of the location of primary visual cortex (V1) in stereotaxic coordinates when linear volume-based registration is used to match volumetric image intensities [Amunts, K., Malikovic, A., Mohlberg, H., Schormann, T., and Zilles, K. (2000). Brodmann's areas 17 and 18 brought into stereotaxic space-where and how variable? Neuroimage, 11(1):66-84]. However, other qualitative reports of V1 location [Smith, G. (1904). The morphology of the occipital region of the cerebral hemisphere in man and the apes. Anatomischer Anzeiger, 24:436-451; Stensaas, S.S., Eddington, D.K.,*

*and Dobelle, W.H. (1974). The topography and variability of the primary visual cortex in man. J Neurosurg, 40(6):747-755; Rademacher, J., Caviness, V.S., Steinmetz, H., and Galaburda, A.M. (1993). Topographical variation of the human primary cortices: implications for neuroimaging, brain mapping, and neurobiology. Cereb Cortex, 3(4):313-329] suggested a consistent relationship between V1 and the surrounding cortical folds. Here, the relationship between folds and the location of V1 is quantified using surface-based analysis to generate a probabilistic atlas of human V1. High-resolution (about 200 microm) magnetic resonance imaging (MRI) at 7 T of ex vivo human cerebral hemispheres allowed identification of the full area via the stria of Gennari: a myeloarchitectonic feature specific to V1. Separate, whole-brain scans were acquired using MRI at 1.5 T to allow segmentation and mesh reconstruction of the cortical gray matter. For each individual, V1 was manually identified in the high-resolution volume and projected onto the cortical surface. Surface-based intersubject registration [Fischl, B., Sereno, M.I., Tootell, R.B., and Dale, A.M. (1999b). High-resolution intersubject averaging and a coordinate system for the cortical surface. Hum Brain Mapp, 8(4):272-84] was performed to align the primary cortical folds of individual hemispheres to those of a reference template representing the average folding pattern. An atlas of V1 location was constructed by computing the probability of V1 inclusion for each cortical location in the template space. This probabilistic atlas of V1 exhibits low prediction error compared to previous V1 probabilistic atlases built in volumetric coordinates. The increased predictability observed under surface-based registration suggests that the location of V1 is more accurately predicted by the cortical folds than by the shape of the brain embedded in the volume of the skull. In addition, the high quality of this atlas provides direct evidence that surface-based intersubject registration methods are superior to volume-based methods at superimposing functional areas of cortex and therefore are better suited to support multisubject averaging for functional imaging experiments targeting the cerebral cortex.</td></tr></tbody></table>
<li id="item-3068" class="item journalArticle"><h2>Locating the functional and anatomical boundaries of human primary visual cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Oliver Hinds</td></tr><tr class="creator author"><th class="author">Author</th><td>Jonathan R. Polimeni</td></tr><tr class="creator author"><th class="author">Author</th><td>Niranjini Rajendran</td></tr><tr class="creator author"><th class="author">Author</th><td>Mukund Balasubramanian</td></tr><tr class="creator author"><th class="author">Author</th><td>Katrin Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>Karl Zilles</td></tr><tr class="creator author"><th class="author">Author</th><td>Eric L. Schwartz</td></tr><tr class="creator author"><th class="author">Author</th><td>Bruce Fischl</td></tr><tr class="creator author"><th class="author">Author</th><td>Christina Triantafyllou</td></tr><tr class="url"><th class="url">URL</th><td>http://www.sciencedirect.com/science/article/pii/S1053811909002754</td></tr><tr class="volume"><th class="volume">Volume</th><td>46</td></tr><tr class="issue"><th class="issue">Issue</th><td>4</td></tr><tr class="pages"><th class="pages">Pages</th><td>915-922</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>July 15, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuroimage.2009.03.036</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The primary visual cortex (V1) can be delineated both functionally by its topographic map of the visual field and anatomically by its

distinct pattern of laminar myelination. Although it is commonly assumed that the specialized anatomy V1 exhibits corresponds in location with functionally defined V1, demonstrating this in human has not been possible thus far due to the difficulty of determining the location of V1 both functionally and anatomically in the same individual. In this study we use MRI to measure the anatomical and functional V1 boundaries in the same individual and demonstrate close agreement between them. Functional V1 location was measured by parcellating occipital cortex of 10 living humans into visual cortical areas based on the topographic map of the visual field measured using functional MRI. Anatomical V1 location was estimated for these same subjects using a surface-based probabilistic atlas derived from high-resolution structural MRI of the stria of Gennari in 10 intact ex vivo human hemispheres. To ensure that the atlas prediction was correct, it was validated against V1 location measured using an observer-independent cortical parcellation based on the laminar pattern of cell density in serial brain sections from 10 separate individuals. The close agreement between the independent anatomically and functionally derived V1 boundaries indicates that the whole extent of V1 can be accurately predicted based on cortical surface reconstructions computed from structural MRI scans, eliminating the need for functional localizers of V1. In addition, that the primary cortical folds predict the location of functional V1 suggests that the mechanism giving rise to V1 location is tied to the development of the cortical folds.</td></tr></tbody></table>
<li id="item-6738" class="item journalArticle"><h2>*Two temporal channels in human V1 identified using fMRI*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Hiroshi Horiguchi</td></tr><tr class="creator author"><th class="author">Author</th><td>Satoshi Nakadomari</td></tr><tr class="creator author"><th class="author">Author</th><td>Masaya Misaki</td></tr><tr class="creator author"><th class="author">Author</th><td>Brian A Wandell</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19361561</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>Apr 8, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuroimage.2009.03.078</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Human visual sensitivity to a fairly broad class of dynamic stimuli can be modeled accurately using two temporal channels. Here, we analyze fMRI measurements of the temporal step response to spatially uniform stimuli to estimate these channels in human primary visual cortex (V1). In agreement with the psychophysical literature, the V1 fMRI temporal responses are modeled accurately as a mixture of two (transient and sustained) channels. We derive estimates of the relative contributions from these two channels at a range of eccentricities. We find that all portions of V1 contain a significant transient response. The central visual field representation includes a significant sustained response, but the amplitude of the sustained channel signal declines with eccentricity. The sustained signals may reflect the emphasis on pattern recognition and color in the central visual field; the dominant transient response in the visual periphery may reflect responses in the human visual attention system.*</td></tr></tbody></table>
<li id="item-17203" class="item journalArticle"><h2>Occipital sulci of the human brain: variability and probability maps</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Giuseppe Iaria</td></tr><tr class="creator author"><th class="author">Author</th><td>Michael Petrides</td></tr><tr class="volume"><th class="volume">Volume</th><td>501</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th class="pages">Pages</th><td>243-259</td></tr><tr class="publicationTitle"><th

class="publicationTitle">Publication</th><td>The Journal of comparative neurology</td></tr><tr class="date"><th class="date">Date</th><td>Mar 10, 2007</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1002/cne.21254</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The morphological variation of the sulci of the occipital region of the human brain was examined in both the left and the right hemispheres in 40 normal adult human brains on magnetic resonance images. We identified the occipital sulci and marked their corresponding gray matter voxels on the magnetic resonance images, which had been transformed into the Montreal Neurological Institute standard proportional stereotaxic space in order to construct probability maps. In the medial occipital region, the calcarine sulcus was the longest and most constant sulcus. We identified, in the inferior part of the medial occipital lobe, the lingual sulcus and the posterior collateral sulcus, and, in the superior part, the inferior and superior sagittal sulci of the cuneus. On the lateral surface of the occipital lobe, the lateral occipital, the lunate, and the transverse and inferior occipital sulci were identified. The parieto-occipital fissure and the temporo-occipital incisure were also identified on the lateral and medial surfaces. Finally, the patterns of the occipital sulci and gyri were examined in 20 post-mortem human hemispheres fixed in formalin. Probability maps of the occipital sulci were constructed, which provide a quantitative description of the variability of the sulci in standard stereotaxic space and may be used to identify the location of voxels in other magnetic resonance images transformed into the same streotaxic space. These maps are a useful tool in the study of functional activations related to visual processing.</td></tr></tbody></table>
<li id="item-17201" class="item journalArticle"><h2>*Three-dimensional probabilistic maps of the occipital sulci of the human brain in standardized stereotaxic space*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>*G Ialria*</td></tr><tr class="creator author"><th class="author">Author</th><td>*S Robbins*</td></tr><tr class="creator author"><th class="author">Author</th><td>*M Petrides*</td></tr><tr class="volume"><th class="volume">Volume</th><td>*151*</td></tr><tr class="issue"><th class="issue">Issue</th><td>*1*</td></tr><tr class="pages"><th class="pages">Pages</th><td>*174-185*</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>*Neuroscience*</td></tr><tr class="date"><th class="date">Date</th><td>*Jan 2, 2008*</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>*10.1016/j.neuroscience.2007.09.050*</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Developments in functional neuroimaging in normal human subjects, such as functional magnetic resonance imaging (fMRI), have permitted the mapping of several visual areas of the human brain and have already provided provisional identification of some of the visual areas that were first described in nonhuman primates. However, the lack of a detailed description of the sulcal patterns of the human occipital lobe makes it difficult to establish clear relationships between sulcal landmarks and identified visual areas with functional neuroimaging. In the present study we used magnetic resonance images to investigate the morphological variation of the human occipital sulci in both the left and right hemispheres of 40 normal adult human brains. We identified 11 occipital sulci, the parieto-occipital fissure and the temporo-occipital incisure, and their corresponding gray matter voxels were marked in the magnetic resonance volumes which had been transformed into the Montreal Neurological Institute standard proportional stereotaxic space. Probability maps were then constructed for each occipital sulcus. These probability maps provide a quantitative measure of the variability of the occipital sulci in standard stereotaxic space and are a useful tool to identify the location of voxels of other magnetic resonance imaging images*

*transformed in the same stereotaxic space.</td></tr></tbody></table>
<li id="item-15487" class="item journalArticle"><h2>Diffusion properties of cortical and pericortical tissue: regional variations, reliability and methodological issues</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Xiaojian Kang</td></tr><tr class="creator author"><th class="author">Author</th><td>Timothy J Herron</td></tr><tr class="creator author"><th class="author">Author</th><td>And U Turken</td></tr><tr class="creator author"><th class="author">Author</th><td>David L Woods</td></tr><tr class="volume"><th class="volume">Volume</th><td>30</td></tr><tr class="issue"><th class="issue">Issue</th><td>8</td></tr><tr class="pages"><th class="pages">Pages</th><td>1111-1122</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Magnetic resonance imaging</td></tr><tr class="date"><th class="date">Date</th><td>Oct 2012</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.mri.2012.04.004</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Characterizing the diffusion properties of cortical tissue is complicated by intersubject variability in the relative locations of gyri and sulci. Here we extend methods of measuring the average diffusion properties of gyral and sulcal structures after they have been aligned to a common template of cortical surface anatomy. Diffusion tensor image (DTI) data were gathered from 82 young subjects and co-registered with high-resolution T1 images that had been inflated and co-registered to a hemispherically unified spherical coordinate system based on FreeSurfer. We analyzed fractional anisotropy (FA), mean diffusivity (MD) and the novel quantity of cortical primary diffusion direction (cPDD) at five surfaces parallel to the white/gray junction, spanning approximately 5 mm from the pial surface into white matter. FA increased with increasing depth, whereas MD and cPDD were reduced. There were highly significant and reliable regional differences in FA, MD and cPDD as well as systematic differences between cortical lobes and between the two hemispheres. The influence of nearby cortical spinal fluid (CSF), local cortical curvature and thickness, and sulcal depth was also investigated. We found that FA correlated significantly with cortical curvature and sulcal depth, while MD was strongly influenced by nearby CSF. The measurement of FA, MD and cPDD near the cortical surface clarifies the organization of fiber projections to and from the cortex.</td></tr></tbody></table>
<li id="item-16773" class="item journalArticle"><h2>A Two-Stage Cascade Model of BOLD Responses in Human Visual Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Kendrick N. Kay</td></tr><tr class="creator author"><th class="author">Author</th><td>Jonathan Winawer</td></tr><tr class="creator author"><th class="author">Author</th><td>Ariel Rokem</td></tr><tr class="creator author"><th class="author">Author</th><td>Aviv Mezer</td></tr><tr class="creator author"><th class="author">Author</th><td>Brian A. Wandell</td></tr><tr class="url"><th class="url">URL</th><td>http://dx.doi.org/10.1371/journal.pcbi.1003079</td></tr><tr class="volume"><th class="volume">Volume</th><td>9</td></tr><tr class="issue"><th class="issue">Issue</th><td>5</td></tr><tr class="pages"><th class="pages">Pages</th><td>e1003079</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>PLoS Comput Biol</td></tr><tr class="date"><th class="date">Date</th><td>May 30, 2013</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1371/journal.pcbi.1003079</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Author SummaryMuch has been*

*learned about how stimuli are represented in the visual system from measuring responses to carefully designed stimuli. Typically, different studies focus on different types of stimuli. Making sense of the large array of findings requires integrated models that explain responses to a wide range of stimuli. In this study, we measure functional magnetic resonance imaging (fMRI) responses in early visual cortex to a wide range of band-pass filtered images, and construct a computational model that takes the stimuli as input and predicts the fMRI responses as output. The model has a cascade architecture, consisting of two stages of linear and nonlinear operations. A novel component of the model is a nonlinear operation that generates selectivity for second-order contrast, that is, variations in contrast-energy across the visual field. We find that this nonlinearity is stronger in extrastriate areas V2 and V3 than in primary visual cortex V1. Our results provide insight into how stimuli are encoded and transformed in the visual system.</td></tr></tbody></table>
<li id="item-4989" class="item journalArticle"><h2>Two Retinotopic Visual Areas in Human Lateral Occipital Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Jonas Larsson</td></tr><tr class="creator author"><th class="author">Author</th><td>David J. Heeger</td></tr><tr class="url"><th class="url">URL</th><td>http://www.jneurosci.org/content/26/51/13128.abstract</td></tr><tr class="volume"><th class="volume">Volume</th><td>26</td></tr><tr class="issue"><th class="issue">Issue</th><td>51</td></tr><tr class="pages"><th class="pages">Pages</th><td>13128 -13142</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>December 20 , 2006</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.1657-06.2006</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>We describe two visual field maps, lateral occipital areas 1 (LO1) and 2 (LO2), in the human lateral occipital cortex between the dorsal part of visual area V3 and visual area V5/MT+. Each map contained a topographic representation of the contralateral visual hemifield. The eccentricity representations were shared with V1/V2/V3. The polar angle representation in LO1 extended from the lower vertical meridian (at the boundary with dorsal V3) through the horizontal to the upper vertical meridian (at the boundary with LO2). The polar angle representation in LO2 was the mirror-reversal of that in LO1. LO1 and LO2 overlapped with the posterior part of the object-selective lateral occipital complex and the kinetic occipital region (KO). The retinotopy and functional properties of LO1 and LO2 suggest that they correspond to two new human visual areas, which lack exact homologues in macaque visual cortex. The topography, stimulus selectivity, and anatomical location of LO1 and LO2 indicate that they integrate shape information from multiple visual submodalities in retinotopic coordinates.</td></tr></tbody></table>
<li id="item-17205" class="item journalArticle"><h2>Occipital sulci of the human brain: variability and morphometry</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Aleksandar Malikovic</td></tr><tr class="creator author"><th class="author">Author</th><td>Biljana Vucetic</td></tr><tr class="creator author"><th class="author">Author</th><td>Milan Milisavljevic</td></tr><tr class="creator author"><th class="author">Author</th><td>Jovo Tosevski</td></tr><tr class="creator author"><th class="author">Author</th><td>Predrag Sazdanovic</td></tr><tr class="creator author"><th class="author">Author</th><td>Bojan Milojevic</td></tr><tr class="creator author"><th class="author">Author</th><td>Slobodan Malobabic</td></tr><tr class="volume"><th*

*class="volume">Volume</th><td>87</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th class="pages">Pages</th><td>61-70</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Anatomical science international</td></tr><tr class="date"><th class="date">Date</th><td>Jun 2012</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1007/s12565-011-0118-6</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The external morphology of the occipital lobe was investigated in 15 human post-mortem brains (30 hemispheres) fixed in formalin. We identified, described and measured the lengths of nine major human occipital sulci and five variable ones, comparing both types between individuals and hemispheres. Morphological variability of human occipital sulci is related to interindividual and interhemispheric differences in their presence, origin, type, segmentation, intersection and length. The major occipital sulci, particularly the parieto-occipital, the calcarine, the inferior lateral occipital and the anterior occipital sulci, as well as two points of their intersections (cuneal point and intersection of the transverse occipital and superior occipital sulcus) may be used as reliable anatomical landmarks for the location of architectonically and functionally defined human visual areas (V1, V2, V3, V3A, V5/MT+, LO1 and LO2) and during less invasive neurosurgical procedures in the cases of focal lesions within the occipital lobe. Two lateral occipital sulci (inferior and superior) were defined on the lateral surface of the occipital lobe. The variable lunate sulcus was studied and combining our results with those from histological and functional imaging studies, we suggest that the lunate sulci of human and nonhuman primates are not homologous.</td></tr></tbody></table>
<li id="item-3893" class="item journalArticle"><h2>When more means less: a paradox BOLD response in human visual cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Valentine L Marcar</td></tr><tr class="creator author"><th class="author">Author</th><td>Andrea Straessle</td></tr><tr class="creator author"><th class="author">Author</th><td>Franck Girard</td></tr><tr class="creator author"><th class="author">Author</th><td>Thomas Loenneker</td></tr><tr class="creator author"><th class="author">Author</th><td>Ernst Martin</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/15120162</td></tr><tr class="volume"><th class="volume">Volume</th><td>22</td></tr><tr class="issue"><th class="issue">Issue</th><td>4</td></tr><tr class="pages"><th class="pages">Pages</th><td>441-450</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Magnetic Resonance Imaging</td></tr><tr class="date"><th class="date">Date</th><td>May 2004</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.mri.2004.01.019</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The predictions of the 'Linear Transfer Model' (LTM) have been tested only by modulating the frequency of the action potentials while keeping the size of the activated neuronal population constant. The LTM states that the blood oxygenation level-dependent contrast (BOLD) signal is directly proportional to the neuronal activity averaged over milliseconds or seconds. We examined the influence on the BOLD response, of manipulating the size of the activated neuronal population while maintaining the electrical discharge activity constant. We performed functional MR measurements on 30 awake, healthy adult volunteers (15 male and 15 female) using a flashed and reversing checkerboard. These stimuli induced the same vascular response and the same increase in the electrical discharge activity but varied in the size of the neuronal population being activated. The BOLD response measured by the extent of activation and the*

BOLD signal amplitude, was larger for the flashed than to the reversing checkerboard. An assessment of the local deoxyhemoglobin (HbR) concentration indicated that the neuronal activity was lower during the flashed checkerboard than the reversing checkerboard. Because the checkerboard associated with the lower neuronal activity yielded the larger number of activated voxels and the larger BOLD signal, our results run contrary to the predictions of the 'Linear Transfer Model' and for this reason we refer to them as paradoxical. Stimuli defined by luminance contrast or a chromatic contrast yielded identical results. We conclude that the 'LTM' may apply to stimuli that modulate the electrical discharge activity but not to stimuli that modulate the size of the activated neuronal population.</td></tr></tbody></table>
<li id="item-15397" class="item journalArticle"><h2>Retinotopic mapping with spin echo BOLD at 7T</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Cheryl A Olman</td></tr><tr class="creator author"><th class="author">Author</th><td>Pierre-Francois Van de Moortele</td></tr><tr class="creator author"><th class="author">Author</th><td>Jennifer F Schumacher</td></tr><tr class="creator author"><th class="author">Author</th><td>Joseph R Guy</td></tr><tr class="creator author"><th class="author">Author</th><td>Kâmil Uğurbil</td></tr><tr class="creator author"><th class="author">Author</th><td>Essa Yacoub</td></tr><tr class="volume"><th class="volume">Volume</th><td>28</td></tr><tr class="issue"><th class="issue">Issue</th><td>9</td></tr><tr class="pages"><th class="pages">Pages</th><td>1258-1269</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Magnetic resonance imaging</td></tr><tr class="date"><th class="date">Date</th><td>Nov 2010</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.mri.2010.06.001</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>For blood oxygenation level-dependent (BOLD) functional MRI experiments, contrast-to-noise ratio (CNR) increases with increasing field strength for both gradient echo (GE) and spin echo (SE) BOLD techniques. However, susceptibility artifacts and nonuniform coil sensitivity profiles complicate large field-of-view fMRI experiments (e.g., experiments covering multiple visual areas instead of focusing on a single cortical region). Here, we use SE BOLD to acquire retinotopic mapping data in early visual areas, testing the feasibility of SE BOLD experiments spanning multiple cortical areas at 7T. We also use a recently developed method for normalizing signal intensity in T(1)-weighted anatomical images to enable automated segmentation of the cortical gray matter for scans acquired at 7T with either surface or volume coils. We find that the CNR of the 7T GE data (average single-voxel, single-scan stimulus coherence: 0.41) is almost twice that of the 3T GE BOLD data (average coherence: 0.25), with the CNR of the SE BOLD data (average coherence: 0.23) comparable to that of the 3T GE data. Repeated measurements in individual subjects find that maps acquired with 1.8-mm resolution at 3T and 7T with GE BOLD and at 7T with SE BOLD show no systematic differences in either the area or the boundary locations for V1, V2 and V3, demonstrating the feasibility of high-resolution SE BOLD experiments with good sensitivity throughout multiple visual areas.</td></tr></tbody></table>
<li id="item-9273" class="item journalArticle"><h2>Quantitative multifocal fMRI shows active suppression in human V1</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Miika Pihlaja</td></tr><tr class="creator author"><th class="author">Author</th><td>Linda Henriksson</td></tr><tr class="creator author"><th class="author">Author</th><td>Andrew C James</td></tr><tr class="creator author"><th class="author">Author</th><td>Simo Vanni</td></tr><tr class="url"><th class="url">URL</th><td><a

href="http://www.ncbi.nlm.nih.gov/pubmed/18381768">http://www.ncbi.nlm.nih.gov/pubmed/18381768</td></tr><tr class="volume"><th class="volume">Volume</th><td>29</td></tr><tr class="issue"><th class="issue">Issue</th><td>9</td></tr><tr class="pages"><th class="pages">Pages</th><td>1001-1014</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Human Brain Mapping</td></tr><tr class="date"><th class="date">Date</th><td>Sep 2008</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1002/hbm.20442</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Multifocal functional magnetic resonance imaging has recently been introduced as an alternative method for retinotopic mapping, and it enables effective functional localization of multiple regions-of-interest in the visual cortex. In this study we characterized interactions in V1 with spatially and temporally identical stimuli presented alone, or as a part of a nine-region multifocal stimulus. We compared stimuli at different contrasts, collinear and orthogonal orientations and spatial frequencies one octave apart. Results show clear attenuation of BOLD signal from the central region in the multifocal condition. The observed modulation in BOLD signal could be produced either by neural suppression resulting from stimulation of adjacent regions of visual field, or alternatively by hemodynamic saturation or stealing effects in V1. However, we find that attenuation of the central response persists through a range of contrasts, and that its strength varies with relative orientation and spatial frequency of the central and surrounding stimulus regions, indicating active suppression mechanisms of neural origin. Our results also demonstrate that the extent of the signal spreading is commensurate with the extent of the horizontal connections in primate V1.</td></tr></tbody></table>
<li id="item-15926" class="item journalArticle"><h2>*The human homologue of macaque area V6A*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>*S Pitzalis*</td></tr><tr class="creator author"><th class="author">Author</th><td>*M I Sereno*</td></tr><tr class="creator author"><th class="author">Author</th><td>*G Committeri*</td></tr><tr class="creator author"><th class="author">Author</th><td>*P Fattori*</td></tr><tr class="creator author"><th class="author">Author</th><td>*G Galati*</td></tr><tr class="creator author"><th class="author">Author</th><td>*A Tosoni*</td></tr><tr class="creator author"><th class="author">Author</th><td>*C Galletti*</td></tr><tr class="volume"><th class="volume">Volume</th><td>*82C*</td></tr><tr class="pages"><th class="pages">Pages</th><td>*517-530*</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>*NeuroImage*</td></tr><tr class="date"><th class="date">Date</th><td>*Jun 14, 2013*</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>*10.1016/j.neuroimage.2013.06.026*</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*In macaque monkeys, V6A is a visuomotor area located in the anterior bank of the POs, dorsal and anterior to retinotopically-organized extrastriate area V6 (Galletti et al., 1996). Unlike V6, V6A represents both contra- and ipsilateral visual fields and is broadly retinotopically organized (Galletti et al., 1999b). The contralateral lower visual field is over-represented in V6A. The central 20°-30° of the visual field is mainly represented dorsally (V6Ad) and the periphery ventrally (V6Av), at the border with V6. Both sectors of area V6A contain arm movement-related cells, active during spatially-directed reaching movements (Gamberini et al., 2011). In humans, we previously mapped the retinotopic organization of area V6 (Pitzalis et al., 2006). Here, using phase-encoded fMRI, cortical surface-based analysis and wide-field retinotopic mapping, we define a new cortical region that borders V6 anteriorly and shows a clear over-representation of the contralateral lower visual field and the periphery. As with macaque V6A, the eccentricity increases moving ventrally within the area. The new region contains a non-mirror-image*

*representation of the visual field. Functional mapping reveals that, as in macaque V6A, the new region, but not the nearby area V6, responds during finger pointing and reaching movements. Based on similarity in position, retinotopic properties, functional organization and relationship with the neighboring extrastriate visual areas, we propose that the new cortical region is the human homologue of macaque area V6A.</td></tr></tbody></table>
<li id="item-4181" class="item journalArticle"><h2>Visual areas and spatial summation in human visual cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>W A Press</td></tr><tr class="creator author"><th class="author">Author</th><td>A A Brewer</td></tr><tr class="creator author"><th class="author">Author</th><td>R F Dougherty</td></tr><tr class="creator author"><th class="author">Author</th><td>A R Wade</td></tr><tr class="creator author"><th class="author">Author</th><td>B A Wandell</td></tr><tr class="volume"><th class="volume">Volume</th><td>41</td></tr><tr class="issue"><th class="issue">Issue</th><td>10-11</td></tr><tr class="pages"><th class="pages">Pages</th><td>1321-32</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Vision Research</td></tr><tr class="date"><th class="date">Date</th><td>2001</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>11322977</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Functional MRI measurements can securely partition the human posterior occipital lobe into retinotopically organized visual areas (V1, V2 and V3) with experiments that last only 30 min. Methods for identifying functional areas in the dorsal and ventral aspect of the human occipital cortex, however, have not achieved this level of precision; in fact, different laboratories have produced inconsistent reports concerning the visual areas in dorsal and ventral occipital lobe. We report four findings concerning the visual representation in dorsal regions of occipital cortex. First, cortex near area V3A contains a central field representation that is distinct from the foveal representation at the confluence of areas V1, V2 and V3. Second, adjacent to V3A there is a second visual area, V3B, which represents both the upper and lower quadrants. The central representation in V3B appears to merge with that of V3A, much as the central representations of V1/2/3 come together on the lateral margin of the posterior pole. Third, there is yet another dorsal representation of the central visual field. This representation falls in area V7, which includes a representation of both the upper and lower quadrants of the visual field. Fourth, based on visual field and spatial summation measurements, it appears that the receptive field properties of neurons in area V7 differ from those in areas V3A and V3B.</td></tr></tbody></table>
<li id="item-15471" class="item journalArticle"><h2>Topographical variation of the human primary cortices: implications for neuroimaging, brain mapping, and neurobiology</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>J Rademacher</td></tr><tr class="creator author"><th class="author">Author</th><td>V S, Jr Caviness</td></tr><tr class="creator author"><th class="author">Author</th><td>H Steinmetz</td></tr><tr class="creator author"><th class="author">Author</th><td>A M Galaburda</td></tr><tr class="volume"><th class="volume">Volume</th><td>3</td></tr><tr class="issue"><th class="issue">Issue</th><td>4</td></tr><tr class="pages"><th class="pages">Pages</th><td>313-329</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral cortex (New York, N.Y.: 1991)</td></tr><tr class="date"><th class="date">Date</th><td>1993 Jul-Aug</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>The relationships of the "primary" cytoarchitectonic neocortical fields, 17, 41, 3b, and 4 (Brodmann areas), to salient topographic landmarks have been reconstructed from serial histological sections in 20 human cerebral hemispheres (10 brains). Each of*

*these architectonic fields is found to bear a characteristic relationship to a set of enframing anatomic landmarks, in particular, gyri, fissures, and sulci, that can be readily defined by MRI. Two classes of variability were found characteristic, at least to some extent, of each of the fields. Class 1 variability–variability that is not predictable from visible landmarks–was typical of the polar and for the cuneal and lingual extracalcarine distributions of field 17 and the distribution of field 4 upon the paracentral lobule. Class 2 variability–variability that is closely predictable from visible landmarks–is seen in the marked interindividual or interhemispheric variation in size or shape of a field and was found to be prominent for all four fields. Because of the prominence of class 2 variability, direct reference to the landmarks that frame these fields may be expected to be a more reliable basis for functional mapping than reference to a template or stereotactic coordinate-based system of reference to a standard or idealized brain.</td></tr></tbody></table>
<li id="item-8669" class="item journalArticle"><h2>Does retinotopy influence cortical folding in primate visual cortex?</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Reza Rajimehr</td></tr><tr class="creator author"><th class="author">Author</th><td>Roger B H Tootell</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19741121</td></tr><tr class="volume"><th class="volume">Volume</th><td>29</td></tr><tr class="issue"><th class="issue">Issue</th><td>36</td></tr><tr class="pages"><th class="pages">Pages</th><td>11149-11152</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience: The Official Journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Sep 9, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.1835-09.2009</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>In humans and other Old World primates, much of visual cortex comprises a set of retinotopic maps, embedded in a cortical sheet with well known, identifiable folding patterns. However, the relationship between these two prominent cortical variables has not been comprehensively studied. Here, we quantitatively tested this relationship using functional and structural magnetic resonance imaging in monkeys and humans. We found that the vertical meridian of the visual field tends to be represented on gyri (convex folds), whereas the horizontal meridian is preferentially represented in sulci (concave folds), throughout visual cortex in both primate species. This relationship suggests that the retinotopic maps may constrain the pattern of cortical folding during development.</td></tr></tbody></table>
<li id="item-18408" class="item journalArticle"><h2>Does Retinotopy Influence Cortical Folding in Primate Visual Cortex?</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Reza Rajimehr</td></tr><tr class="creator author"><th class="author">Author</th><td>Roger B. H. Tootell</td></tr><tr class="url"><th class="url">URL</th><td>http://www.jneurosci.org/content/29/36/11149</td></tr><tr class="volume"><th class="volume">Volume</th><td>29</td></tr><tr class="issue"><th class="issue">Issue</th><td>36</td></tr><tr class="pages"><th class="pages">Pages</th><td>11149-11152</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>09/09/2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1523/JNEUROSCI.1835-09.2009</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>In humans and other Old World primates, much of visual cortex comprises a set of retinotopic maps, embedded in a cortical sheet*

*with well known, identifiable folding patterns. However, the relationship between these two prominent cortical variables has not been comprehensively studied. Here, we quantitatively tested this relationship using functional and structural magnetic resonance imaging in monkeys and humans. We found that the vertical meridian of the visual field tends to be represented on gyri (convex folds), whereas the horizontal meridian is preferentially represented in sulci (concave folds), throughout visual cortex in both primate species. This relationship suggests that the retinotopic maps may constrain the pattern of cortical folding during development.</td></tr></tbody></table>
<li id="item-3000" class="item journalArticle"><h2>Correspondence of human visual areas identified using functional and anatomical MRI in vivo at 7 T</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Rosa M. Sánchez-Panchuelo</td></tr><tr class="creator author"><th class="author">Author</th><td>Susan T. Francis</td></tr><tr class="creator author"><th class="author">Author</th><td>Denis Schluppeck</td></tr><tr class="creator author"><th class="author">Author</th><td>Richard W. Bowtell</td></tr><tr class="url"><th class="url">URL</th><td>http://onlinelibrary.wiley.com/doi/10.1002/jmri.22822/abstract</td></tr><tr class="volume"><th class="volume">Volume</th><td>35</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th class="pages">Pages</th><td>287–299</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Journal of Magnetic Resonance Imaging</td></tr><tr class="date"><th class="date">Date</th><td>2012</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1002/jmri.22822</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Purpose:To study the correspondence of anatomically and functionally defined visual areas (primary visual cortex, V1, and motion selective area V5/human MT+) by using structural magnetic resonance imaging (MRI) and functional MRI (fMRI) in vivo at 7 T.Materials and Methods:Four subjects participated in this study. High-resolution (≈0.4 mm isotropic) anatomical MRI was used to identify cortical regions based on their distinct cortical lamination. The optimal contrast for identifying heavily myelinated layers within gray matter was quantitatively assessed by comparing T1-weighted magnetization-prepared rapid gradient echo (MPRAGE) and T2*-weighted, 3D fast-low angle shot (FLASH) imaging. Retinotopic mapping was performed using GE-based fMRI at 1.5 mm isotropic resolution to identify functional areas.Results:T2*-weighted FLASH imaging was found to provide a significantly higher contrast-to-noise ratio, allowing visualization of the stria of Gennari in every slice of a volume covering the occipital cortex in each of the four subjects in this study. The independently derived boundary of V1, identified in the same subjects using retinotopic mapping by fMRI, closely matched the border of anatomically defined striate cortex in the human brain. Evidence of banding was also found within the functionally defined V5 area; however, we did not find a good correlation of this area, or the functionally identified subregion (MT), with the banded area.Conclusion:High-resolution T2*-weighted images acquired at 7 T can be used to identify myelinated bands within cortical gray matter in reasonable measurement times. Regions where a myelinated band was identified show a high degree of overlap with the functionally defined V1 area. J. Magn. Reson. Imaging 2012;287-299. © 2011 Wiley Periodicals, Inc.</td></tr></tbody></table>
<li id="item-5785" class="item journalArticle"><h2>Retinotopy and Attention in Human Occipital, Temporal, Parietal, and Frontal Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Ayse Pinar Saygin</td></tr><tr class="creator author"><th*

*class="author">Author</th><td>Martin I. Sereno</td></tr><tr class="url"><th class="url">URL</th><td>http://cercor.oxfordjournals.org/content/18/9/2158.abstract</td></tr><tr class="volume"><th class="volume">Volume</th><td>18</td></tr><tr class="issue"><th class="issue">Issue</th><td>9</td></tr><tr class="pages"><th class="pages">Pages</th><td>2158 -2168</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral Cortex</td></tr><tr class="date"><th class="date">Date</th><td>2008</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bhm242</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Novel mapping stimuli composed of biological motion figures were used to study the extent and layout of multiple retinotopic regions in the entire human brain and to examine the independent manipulation of retinotopic responses by visual stimuli and by attention. A number of areas exhibited retinotopic activations, including full or partial visual field representations in occipital cortex, the precuneus, motion-sensitive temporal cortex (extending into the superior temporal sulcus), the intraparietal sulcus, and the vicinity of the frontal eye fields in frontal cortex. Early visual areas showed mainly stimulus-driven retinotopy; parietal and frontal areas were driven primarily by attention; and lateral temporal regions could be driven by both. We found clear spatial specificity of attentional modulation not just in early visual areas but also in classical attentional control areas in parietal and frontal cortex. Indeed, strong spatiotopic activity in these areas could be evoked by directed attention alone. Conversely, motion-sensitive temporal regions, while exhibiting attentional modulation, also responded significantly when attention was directed away from the retinotopic stimuli.</td></tr></tbody></table>
<li id="item-15417" class="item journalArticle"><h2>Mapping the human cortical surface by combining quantitative t1 with retinotopy</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Martin I Sereno</td></tr><tr class="creator author"><th class="author">Author</th><td>Antoine Lutti</td></tr><tr class="creator author"><th class="author">Author</th><td>Nikolaus Weiskopf</td></tr><tr class="creator author"><th class="author">Author</th><td>Frederic Dick</td></tr><tr class="volume"><th class="volume">Volume</th><td>23</td></tr><tr class="issue"><th class="issue">Issue</th><td>9</td></tr><tr class="pages"><th class="pages">Pages</th><td>2261-2268</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral cortex (New York, N.Y.: 1991)</td></tr><tr class="date"><th class="date">Date</th><td>Sep 2013</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bhs213</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>We combined quantitative relaxation rate (R1= 1/T1) mapping-to measure local myelination-with fMRI-based retinotopy. Gray-white and pial surfaces were reconstructed and used to sample R1 at different cortical depths. Like myelination, R1 decreased from deeper to superficial layers. R1 decreased passing from V1 and MT, to immediately surrounding areas, then to the angular gyrus. High R1 was correlated across the cortex with convex local curvature so the data was first "de-curved". By overlaying R1 and retinotopic maps, we found that many visual area borders were associated with significant R1 increases including V1, V3A, MT, V6, V6A, V8/VO1, FST, and VIP. Surprisingly, retinotopic MT occupied only the posterior portion of an oval-shaped lateral occipital R1 maximum. R1 maps were reproducible within individuals and comparable between subjects without intensity normalization, enabling multi-center studies of development, aging, and disease progression, and structure/function mapping in other modalities.</td></tr></tbody></table>
<li id="item-4197" class="item journalArticle"><h2><a*

href="zotero:*select/items/0_5UQZDHTS*">*Mechanisms underlying decoding at 7 T: Ocular dominance columns, broad structures, and macroscopic blood vessels in V1 convey information on the stimulated eye*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Amir Shmuel</td></tr><tr class="creator author"><th class="author">Author</th><td>Denis Chaimow</td></tr><tr class="creator author"><th class="author">Author</th><td>Guenter Raddatz</td></tr><tr class="creator author"><th class="author">Author</th><td>Kamil Ugurbil</td></tr><tr class="creator author"><th class="author">Author</th><td>Essa Yacoub</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19715765</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>Aug 26, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuroimage.2009.08.040</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Recent studies have demonstrated that multivariate machine learning algorithms applied to human functional MRI data can decode information segregated in cortical columns, despite the voxel size being large relative to the width of columns. The mechanism by which low spatial resolution imaging decodes information represented in a fine-scale organization is not clear. To investigate mechanisms underlying decoding signals we employed high-resolution gradient-echo BOLD functional MRI of visual area V1. We show that in addition to the fine-scale ocular dominance columns, coarse-scale structures extending over several millimeters also convey discriminative power for decoding the stimulated eye. Discriminative power is conveyed by both macroscopic blood vessels and gray matter regions. We hypothesize that gray-matter regions which drain into specific vessels may preferentially contain ocular-dominance columns biased towards one eye; the bias of a specific region thereby causing a functionally selective ocular-dominance response in the associated vessel. Our findings indicate that coarse-scale structures and macroscopic blood vessels contribute to decoding of the stimulated eye based on low-resolution multivariate data.*</td></tr></tbody></table>
<li id="item-5889" class="item journalArticle"><h2>Topography of attention in the primary visual cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Jaana Simola</td></tr><tr class="creator author"><th class="author">Author</th><td>Linda Stenbacka</td></tr><tr class="creator author"><th class="author">Author</th><td>Simo Vanni</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19087165</td></tr><tr class="volume"><th class="volume">Volume</th><td>29</td></tr><tr class="issue"><th class="issue">Issue</th><td>1</td></tr><tr class="pages"><th class="pages">Pages</th><td>188-196</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The European Journal of Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>Jan 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1111/j.1460-9568.2008.06558.x</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Previous research suggests that feedback circuits mediate the effect of attention to the primary visual cortex (V1). This inference is mainly based on temporal information of the responses, where late modulation is associated with feedback signals. However, temporal data alone are inconclusive because the anatomical hierarchy

between cortical areas differs significantly from the temporal sequence of activation. In the current work, we relied on recent physiological and computational models of V1 network architecture, which have shown that the thalamic feedforward, local horizontal and feedback contribution are reflected in the spatial spread of responses. We used multifocal functional localizer and quantitative analysis in functional magnetic resonance imaging to determine the spatial scales of attention and sensory responses. Representations of 60 visual field regions in V1 were functionally localized and four of these regions were targets in a subsequent attention experiment, where human volunteers fixated centrally and performed a visual discrimination task at the attended location. Attention enhanced the peak amplitudes significantly more in the lower than in the upper visual field. This enhancement by attention spread with a 2.4 times larger radius (approximately 10 mm, assuming an average magnification factor) compared with the unattended response. The corresponding target region of interest was on average 20% stronger than that caused by the afferent sensory stimulation alone. This modulation could not be attributed to eye movements. Given the contemporary view of primate V1 connections, the activation spread along the cortex provides further evidence that the signal enhancement by spatial attention is dependent on feedback circuits.</td></tr></tbody></table>
<li id="item-7928" class="item journalArticle"><h2>Additive Effects of Attention and Stimulus Contrast in Primary Visual Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Alexander Thiele</td></tr><tr class="creator author"><th class="author">Author</th><td>Arezoo Pooresmaeili</td></tr><tr class="creator author"><th class="author">Author</th><td>Louise S Delicato</td></tr><tr class="creator author"><th class="author">Author</th><td>Jose L Herrero</td></tr><tr class="creator author"><th class="author">Author</th><td>Pieter R Roelfsema</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19372142</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral Cortex (New York, N.Y.: 1991)</td></tr><tr class="date"><th class="date">Date</th><td>Apr 16, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bhp070</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Previous studies have proposed a variety of mechanisms by which attention influences neuronal activity. Here we investigated the mechanisms of attention in the striate cortex of monkeys performing a spatial or an object-based attention task at various stimulus contrasts and compared neuronal contrast response functions with and without attention. Our data are best described by an "additive" interaction: The influence of attention on the neuronal response is relatively independent of the stimulus contrast, at least when the stimulus has enough contrast to become visible. This shows that attention adds to the neuronal responses in a largely contrast invariant manner. These data support recent functional magnetic resonance imaging studies and suggest that feedback from higher areas exerts a constant attentional drive that is mostly task not stimulus driven.</td></tr></tbody></table>
<li id="item-15467" class="item journalArticle"><h2>Three-Dimensional Statistical Analysis of Sulcal Variability in the Human Brain</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Paul M. Thompson</td></tr><tr class="creator author"><th class="author">Author</th><td>Craig Schwartz</td></tr><tr class="creator author"><th class="author">Author</th><td>Robert T. Lin</td></tr><tr class="creator author"><th class="author">Author</th><td>Aelia A. Khan</td></tr><tr class="creator author"><th class="author">Author</th><td>Arthur W. Toga</td></tr><tr class="url"><th class="url">URL</th><td>http://www.jneurosci.org/content/16/13/4261

</td></tr><tr class="volume"><th class="volume">Volume</th><td>16</td></tr><tr class="issue"><th class="issue">Issue</th><td>13</td></tr><tr class="pages"><th class="pages">Pages</th><td>4261-4274</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>07/01/1996</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Morphometric variance of the human brain is qualitatively observable in surface features of the cortex. Statistical analysis of sulcal geometry will facilitate multisubject atlasing, neurosurgical studies, and multimodality brain mapping applications. This investigation describes the variability in location and geometry of five sulci surveyed in each hemisphere of six postmortem human brains placed within the Talairach stereotaxic grid. The sulci were modeled as complex internal surfaces in the brain. Heterogeneous profiles of three-dimensional (3D) variation were quantified locally within individual sulci. Whole human heads, sectioned at 50 µm, were digitally photographed and high-resolution 3D data volumes were reconstructed. The parieto-occipital sulcus, the anterior and posterior rami of the calcarine sulcus, the cingulate and marginal sulci, and the supracallosal sulcus were delineated manually on sagittally resampled sections. Sulcal outlines were reparameterized for surface comparisons. Statistics of 3D variation for arbitrary points on each surface were calculated locally from the standardized individual data. Additional measures of surface area, extent in three dimensions, surface curvature, and fractal dimension were used to characterize variations in sulcal geometry. Paralimbic sulci exhibited a greater degree of anterior– posterior variability than vertical variability. Occipital sulci displayed the reverse trend. Both trends were consistent with developmental growth patterns. Points on the occipital sulci displayed a profile of variability highly correlated with their 3D distance from the posterior commissure. Surface curvature was greater for the arched paralimbic sulci than for those bounding occipital gyri in each hemisphere. On the other hand, fractal dimension measures were remarkably similar for all sulci examined, and no significant hemispheric asymmetries were found for any of the selected spatial and geometric parameters. Implications of cortical morphometric variability for multisubject comparisons and brain mapping applications are discussed.</td></tr></tbody></table>
<li id="item-7276" class="item journalArticle"><h2>*Where is 'dorsal V4' in human visual cortex? Retinotopic, topographic and functional evidence*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>R B Tootell</td></tr><tr class="creator author"><th class="author">Author</th><td>N Hadjikhani</td></tr><tr class="volume"><th class="volume">Volume</th><td>11</td></tr><tr class="issue"><th class="issue">Issue</th><td>4</td></tr><tr class="pages"><th class="pages">Pages</th><td>298-311</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral Cortex (New York, N.Y.: 1991)</td></tr><tr class="date"><th class="date">Date</th><td>Apr 2001</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>11278193</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*In flattened human visual cortex, we defined the topographic homologue of macaque dorsal V4 (the 'V4d topologue'), based on neighborhood relations among visual areas (i.e. anterior to V3A, posterior to MT+, and superior to ventral V4). Retinotopic functional magnetic resonance imaging (fMRI) data suggest that two visual areas ('LOC' and 'LOP') are included within this V4d topologue. Except for an overall bias for either central or peripheral stimuli (respectively), the retinotopy within LOC and LOP was crude or nonexistent. Thus the retinotopy in the human V4d topologue differed from previous reports in macaque V4d. Unlike some previous reports in macaque V4d, the human V4d topologue was not significantly color-selective. However, the V4d topologue did respond selectively to kinetic motion boundaries, consistent with*

*previous human fMRI reports. Because striking differences were found between the retinotopy and functional properties of the human topologues of 'V4v' and 'V4d', it is unlikely that these two cortical regions are subdivisions of a singular human area 'V4'.</td></tr></tbody></table>
<li id="item-18396" class="item journalArticle"><h2>Functional anatomy of macaque striate cortex. II. Retinotopic organization</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>R B Tootell</td></tr><tr class="creator author"><th class="author">Author</th><td>E Switkes</td></tr><tr class="creator author"><th class="author">Author</th><td>M S Silverman</td></tr><tr class="creator author"><th class="author">Author</th><td>S L Hamilton</td></tr><tr class="volume"><th class="volume">Volume</th><td>8</td></tr><tr class="issue"><th class="issue">Issue</th><td>5</td></tr><tr class="pages"><th class="pages">Pages</th><td>1531-1568</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>The Journal of neuroscience: the official journal of the Society for Neuroscience</td></tr><tr class="date"><th class="date">Date</th><td>May 1988</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Macaque monkeys were shown retinotopically-specific visual stimuli during 14C-2-deoxy-d-glucose (DG) infusion in a study of the retinotopic organization of primary visual cortex (V1). In the central half of V1, the cortical magnification was found to be greater along the vertical than along the horizontal meridian, and overall magnification factors appeared to be scaled proportionate to brain size across different species. The cortical magnification factor (CMF) was found to reach a maximum of about 15 mm/deg at the representation of the fovea, at a point of acute curvature in the V1-V2 border. We find neither a duplication nor an overrepresentation of the vertical meridian. The magnification factor did not appear to be doubled in a direction perpendicular to the ocular dominance strips; it may not be increased at all. The DG borders in parvorecipient layer 4Cb were found to be as sharp as 140 micron (half-amplitude, half width), corresponding to a visual angle of less than 2' of arc at the eccentricity measured. In other layers (including magnorecipient layer 4Ca), the retinotopic borders are broader. The retinotopic spread of activity is greater when produced by a low-spatial-frequency grating than when produced by a high-spatial-frequency grating. Orientation-specific stimuli produced a pattern of activation that spread further than 1 mm across cortex in some layers. Some DG evidence suggests that the spread of functional activity is greater near the foveal representation than near 5 degrees eccentricity.</td></tr></tbody></table>
<li id="item-6537" class="item journalArticle"><h2>Extended Concepts of Occipital Retinotopy</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Christopher W. Tyler</td></tr><tr class="creator author"><th class="author">Author</th><td>Lora T. Likova</td></tr><tr class="creator author"><th class="author">Author</th><td>Chien-Chung Chen</td></tr><tr class="creator author"><th class="author">Author</th><td>Leonid L. Kontsevich</td></tr><tr class="creator author"><th class="author">Author</th><td>Mark M. Schira</td></tr><tr class="creator author"><th class="author">Author</th><td>Alex R. Wade</td></tr><tr class="volume"><th class="volume">Volume</th><td>1</td></tr><tr class="pages"><th class="pages">Pages</th><td>319-329</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Current Medical Imaging Reviews</td></tr><tr class="date"><th class="date">Date</th><td>November 2005</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.2174/157340505774574772</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Retinotopic mapping is a key property of organization of occipital cortex, predominantly on the medial surface but increasingly being*

*identified in lateral and ventral regions. The retinotopic organization of early visual areas V1-3 is well established, although anatomical landmarks can help to resolve ambiguities in poorly-defined functional maps. New morphing techniques are now available to define the metric mappings quantitatively within each retinotopic area. In the dorsal occipital regions, there is fair agreement that area V3A should be split into separate V3A and V3B maps, and that beyond them lies a further area, V7. We specify the eccentricity mapping of both V3B and V7 for the first time, showing how the latter is roughly parallel to the meridional mapping and offering formal accounts of such paradoxical behavior. In ventral occipital cortex, we support the analysis of Zeki and Bartels [1] and Wade et al. [2] that V4 maps the full hemifield, and show the existence of two more areas, a ventromedial map of the lower quadrant, emphasizing the upper vertical meridian, and an adjacent area with a dominant foveal representation. In lateral cortex, the motion area defined by a motion localizer shows pronounced retinotopy, particularly in the eccentricity parameter. A dorsolateral map between the motion area and V3B, which represents the lower quadrant with an emphasis the foveal part of the lower vertical meridian, may be a counterpart to the ventromedial map.</td></tr></tbody></table>
<li id="item-15473" class="item journalArticle"><h2>Consequences of large interindividual variability for human brain atlases: converging macroscopical imaging and microscopical neuroanatomy</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>H B M Uylings</td></tr><tr class="creator author"><th class="author">Author</th><td>G Rajkowska</td></tr><tr class="creator author"><th class="author">Author</th><td>E Sanz-Arigita</td></tr><tr class="creator author"><th class="author">Author</th><td>K Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>K Zilles</td></tr><tr class="volume"><th class="volume">Volume</th><td>210</td></tr><tr class="issue"><th class="issue">Issue</th><td>5-6</td></tr><tr class="pages"><th class="pages">Pages</th><td>423-431</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Anatomy and embryology</td></tr><tr class="date"><th class="date">Date</th><td>Dec 2005</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1007/s00429-005-0042-4</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>In human brain imaging studies, it is common practice to use the Talairach stereotaxic reference system for signifying the convergence of brain function and structure. In nearly all neuroimaging reports, the studied cortical areas are specified further with a Brodmann Area (BA) number. This specification is based upon macroscopic extrapolation from Brodmann's projection maps into the Talairach atlas rather than upon a real microscopic cytoarchitectonic study. In this review we argue that such a specification of Brodmann area(s) via the Talairach atlas is not appropriate. Cytoarchitectonic studies reviewed in this paper show large interindividual differences in 3-D location of primary sensory cortical areas (visual cortex) as well as heteromodal associational areas (prefrontal cortical areas), even after correction for differences in brain size and shape. Thus, the simple use of Brodmann cortical areas derived from the Talairach atlas can lead to erroneous results in the specification of pertinent BA. This in turn can further lead to wrong hypotheses on brain system(s) involved in normal functions or in specific brain disorders. In addition, we will briefly discuss the different 'Brodmann' nomenclatures which are in use for the cerebral cortex.</td></tr></tbody></table>
<li id="item-5102" class="item journalArticle"><h2>Functional measurements of human ventral occipital cortex: retinotopy and colour</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Alex R Wade</td></tr><tr class="creator author"><th*

*class="author">Author</th><td>Alyssa A Brewer</td></tr><tr class="creator author"><th class="author">Author</th><td>Jochem W Rieger</td></tr><tr class="creator author"><th class="author">Author</th><td>Brian A Wandell</td></tr><tr class="volume"><th class="volume">Volume</th><td>357</td></tr><tr class="issue"><th class="issue">Issue</th><td>1424</td></tr><tr class="pages"><th class="pages">Pages</th><td>963-73</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences</td></tr><tr class="date"><th class="date">Date</th><td>Aug 29, 2002</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>12217168</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Human colour vision originates in the cone photoreceptors, whose spatial density peaks in the fovea and declines rapidly into the periphery. For this reason, one expects to find a large representation of the cone-rich fovea in those cortical locations that support colour perception. Human occipital cortex contains several distinct foveal representations including at least two that extend onto the ventral surface: a region thought to be critical for colour vision. To learn more about these ventral signals, we used functional magnetic resonance imaging to identify visual field maps and colour responsivity on the ventral surface. We found a visual map of the complete contralateral hemifield in a 4 cm(2) region adjacent to ventral V3; the foveal representation of this map is confluent with that of areas V1/2/3. Additionally, a distinct foveal representation is present on the ventral surface situated 3-5 cm anterior from the confluent V1/2/3 foveal representations. This organization is not consistent with the definition of area V8, which assumes the presence of a quarter field representation adjacent to V3v. Comparisons of responses to luminance-matched coloured and achromatic patterns show increased activity to the coloured stimuli beginning in area V1 and extending through the new hemifield representation and further anterior in the ventral occipital lobe.</td></tr></tbody></table>
<li id="item-5636" class="item journalArticle"><h2>Imaging retinotopic maps in the human brain</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Brian A. Wandell</td></tr><tr class="creator author"><th class="author">Author</th><td>Jonathan Winawer</td></tr><tr class="url"><th class="url">URL</th><td>http://www.sciencedirect.com/science/article/B6T0W-50PVFVV-2/2/bc2432011e90ba449229081d411be736</td></tr><tr class="volume"><th class="volume">Volume</th><td>51</td></tr><tr class="issue"><th class="issue">Issue</th><td>7</td></tr><tr class="pages"><th class="pages">Pages</th><td>718-737</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Vision Research</td></tr><tr class="date"><th class="date">Date</th><td>April 13, 2011</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.visres.2010.08.004</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td><p>
A quarter-century ago visual neuroscientists had little information about the number and organization of retinotopic maps in human visual cortex. The advent of functional magnetic resonance imaging (MRI), a non-invasive, spatially-resolved technique for measuring brain activity, provided a wealth of data about human retinotopic maps. Just as there are differences amongst non-human primate maps, the human maps have their own unique properties. Many human maps can be measured reliably in individual subjects during experimental sessions lasting less than an hour. The efficiency of the measurements and the relatively large amplitude of functional MRI signals in visual cortex make it possible to develop

quantitative models of functional responses within specific maps in individual subjects. During this last quarter-century, there has also been significant progress in measuring properties of the human brain at a range of length and time scales, including white matter pathways, macroscopic properties of gray and white matter, and cellular and molecular tissue properties. We hope the next 25 years will see a great deal of work that aims to integrate these data by modeling the network of visual signals. We do not know what such theories will look like, but the characterization of human retinotopic maps from the last 25 years is likely to be an important part of future ideas about visual computations.</p></td></tr></tbody></table>
<li id="item-10332" class="item journalArticle"><h2>Visual Field Maps in Human Cortex</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Brian A. Wandell</td></tr><tr class="creator author"><th class="author">Author</th><td>Serge O. Dumoulin</td></tr><tr class="creator author"><th class="author">Author</th><td>Alyssa A. Brewer</td></tr><tr class="url"><th class="url">URL</th><td>http://www.sciencedirect.com/science/article/pii/S089662730700774X</td></tr><tr class="volume"><th class="volume">Volume</th><td>56</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th class="pages">Pages</th><td>366-383</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Neuron</td></tr><tr class="date"><th class="date">Date</th><td>October 25, 2007</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuron.2007.10.012</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Summary Much of the visual cortex is organized into visual field maps: nearby neurons have receptive fields at nearby locations in the image. Mammalian species generally have multiple visual field maps with each species having similar, but not identical, maps. The introduction of functional magnetic resonance imaging made it possible to identify visual field maps in human cortex, including several near (1) medial occipital (V1,V2,V3), (2) lateral occipital (LO-1,LO-2, hMT+), (3) ventral occipital (hV4, VO-1, VO-2), (4) dorsal occipital (V3A, V3B), and (5) posterior parietal cortex (IPS-0 to IPS-4). Evidence is accumulating for additional maps, including some in the frontal lobe. Cortical maps are arranged into clusters in which several maps have parallel eccentricity representations, while the angular representations within a cluster alternate in visual field sign. Visual field maps have been linked to functional and perceptual properties of the visual system at various spatial scales, ranging from the level of individual maps to map clusters to dorsal-ventral streams. We survey recent measurements of human visual field maps, describe hypotheses about the function and relationships between maps, and consider methods to improve map measurements and characterize the response properties of neurons comprising these maps.</td></tr></tbody></table>
<li id="item-21466" class="item journalArticle"><h2>Visual Field Maps of the Human Visual Cortex for Central and Peripheral Vision</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Bin Wang</td></tr><tr class="creator author"><th class="author">Author</th><td>Hiroki Yamamoto</td></tr><tr class="creator author"><th class="author">Author</th><td>Jinglong Wu</td></tr><tr class="creator author"><th class="author">Author</th><td>Yoshimichi Ejima</td></tr><tr class="volume"><th class="volume">Volume</th><td>1</td></tr><tr class="issue"><th class="issue">Issue</th><td>2</td></tr><tr class="pages"><th

class="pages">Pages</th><td>102-110</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Neuroscience and Biomedical Engineering</td></tr><tr class="date"><th class="date">Date</th><td>2013-09-01T00:00:00/</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>In humans, visual information in the peripheral visual field is processed differently from such information in the central visual field. For example, peripheral vision prefers coarser information, while central vision prefers finer details. Recent advances in neuroimaging allowed us to non-invasively explore the neural substrates underlying the distinctiveness of peripheral and central vision. In the human visual cortex, there is a mosaic of orderly representations of the visual field, and this organization is called a visual field map. In this review, we summarize the various strands of research on visual field maps, which are crucial to understand human peripheral vision. We first describe the techniques that are used to measure visual field maps by means of functional magnetic resonance imaging (fMRI). We then review several studies that have tried to locate human visual areas using these techniques. We focused particularly on the findings of retinotopic organization for "far" peripheral visual field and tried to find the cortical regions that are crucial for peripheral vision.</td></tr></tbody></table>
<li id="item-9483" class="item journalArticle"><h2>Comparison of functional and cytoarchitectonic maps of human visual areas V1, V2, V3d, V3v, and V4(v)</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Marcus Wilms</td></tr><tr class="creator author"><th class="author">Author</th><td>Simon B Eickhoff</td></tr><tr class="creator author"><th class="author">Author</th><td>Lars Hömke</td></tr><tr class="creator author"><th class="author">Author</th><td>Claudia Rottschy</td></tr><tr class="creator author"><th class="author">Author</th><td>Milenko Kujovic</td></tr><tr class="creator author"><th class="author">Author</th><td>Katrin Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>Gereon R Fink</td></tr><tr class="url"><th class="url">URL</th><td>http://www.ncbi.nlm.nih.gov/pubmed/19800409</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>Oct 1, 2009</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.neuroimage.2009.09.063</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Cytoarchitectonic maps of human striate and extrastriate visual cortex based upon post-mortem brains can be correlated with functionally defined cortical areas using, for example, fMRI. We here assess the correspondence of anatomical maps of the visual cortex with functionally defined in vivo visual areas using retinotopic mapping. To this end, anatomical maximum probability maps (aMPM) derived from individual cytoarchitectonic maps of striate and extrastriate visual areas were compared with functional localisers for the early visual areas. Using fMRI, we delineated dorsal and ventral human retinotopic areas V1, V2, and V3, as well as a quarter-field visual field representation lateral to V3v, V4(v), in 24 healthy subjects. Based on these individual definitions, a functional maximum probability map (fMPM) was then computed in analogy to the aMPM. Functional and anatomical MPMs were highly correlated at group level: 78.5% of activated voxels in the fMPM were correctly assigned by the aMPM. The group aMPM was less effective in predicting functional retinotopic areas in the individual brain due to the large inter-individual variability in the location and extent of visual areas (mean overlap 32-69%). We conclude that cytoarchitectonic maps of striate and extrastriate visual areas may provide a valuable method for assigning functional group activations and thus add valuable a priori knowledge to the analysis of functional imaging data of the visual cortex.</td></tr></tbody></table>
<li id="item-17199" class="item

journalArticle"><h2>*Where Is Human V4? Predicting the Location of hV4 and VO1 from Cortical Folding*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Nathan Witthoft</td></tr><tr class="creator author"><th class="author">Author</th><td>Mai Lin Nguyen</td></tr><tr class="creator author"><th class="author">Author</th><td>Golijeh Golarai</td></tr><tr class="creator author"><th class="author">Author</th><td>Karen F Larocque</td></tr><tr class="creator author"><th class="author">Author</th><td>Alina Liberman</td></tr><tr class="creator author"><th class="author">Author</th><td>Mary E Smith</td></tr><tr class="creator author"><th class="author">Author</th><td>Kalanit Grill-Spector</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Cerebral cortex (New York, N.Y.: 1991)</td></tr><tr class="date"><th class="date">Date</th><td>Apr 16, 2013</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1093/cercor/bht092</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>A strong relationship between cortical folding and the location of primary sensory areas in the human brain is well established. However, it is unknown if coupling between functional responses and gross anatomy is found at higher stages of sensory processing. We examined the relationship between cortical folding and the location of the retinotopic maps hV4 and VO1, which are intermediate stages in the human ventral visual processing stream. Our data show a consistent arrangement of the eccentricity maps within hV4 and VO1 with respect to anatomy, with the consequence that the hV4/VO1 boundary is found consistently in the posterior transverse collateral sulcus (ptCoS) despite individual variability in map size and cortical folding. Understanding this relationship allowed us to predict the location of visual areas hV4 and VO1 in a separate set of individuals, using only their anatomies, with >85% accuracy. These findings have important implications for understanding the relation between cortical folding and functional maps as well as for defining visual areas from anatomical landmarks alone.</td></tr></tbody></table>
<li id="item-3013" class="item journalArticle"><h2>Linking retinotopic fMRI mapping and anatomical probability maps of human occipital areas V1 and V2</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>A.M. Wohlschläger</td></tr><tr class="creator author"><th class="author">Author</th><td>K. Specht</td></tr><tr class="creator author"><th class="author">Author</th><td>C. Lie</td></tr><tr class="creator author"><th class="author">Author</th><td>H. Mohlberg</td></tr><tr class="creator author"><th class="author">Author</th><td>A. Wohlschläger</td></tr><tr class="creator author"><th class="author">Author</th><td>K. Bente</td></tr><tr class="creator author"><th class="author">Author</th><td>U. Pietrzyk</td></tr><tr class="creator author"><th class="author">Author</th><td>T. Stöcker</td></tr><tr class="creator author"><th class="author">Author</th><td>K. Zilles</td></tr><tr class="creator author"><th class="author">Author</th><td>K. Amunts</td></tr><tr class="creator author"><th class="author">Author</th><td>G.R. Fink</td></tr><tr class="url"><th class="url">URL</th><td>http://www.sciencedirect.com/science/article/pii/S1053811905000522</td></tr><tr class="volume"><th class="volume">Volume</th><td>26</td></tr><tr class="issue"><th class="issue">Issue</th><td>1</td></tr><tr class="pages"><th class="pages">Pages</th><td>73-82</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>NeuroImage</td></tr><tr class="date"><th class="date">Date</th><td>May 15, 2005</td></tr><tr class="DOI"><th

class="DOI">DOI</th><td>10.1016/j.neuroimage.2005.01.021</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>Using functional MRI, we characterized field sign maps of the occipital cortex and created three-dimensional maps of these areas. By averaging the individual maps into group maps, probability maps of functionally defined V1 or V2 were determined and compared to anatomical probability maps of Brodmann areas BA17 and BA18 derived from cytoarchitectonic analysis (Amunts, K., Malikovic, A., Mohlberg, H., Schormann, T., Zilles, K., 2000. Brodmann's areas 17 and 18 brought into stereotaxic space—where and how variable? NeuroImage 11, 66–84). Comparison of areas BA17/V1 and BA18/V2 revealed good agreement of the anatomical and functional probability maps. Taking into account that our functional stimulation (due to constraints of the visual angle of stimulation achievable in the MR scanner) only identified parts of V1 and V2, for statistical evaluation of the spatial correlation of V1 and BA17, or V2 and BA18, respectively, the a priori measure κ was calculated testing the hypothesis that a region can only be part of functionally defined V1 or V2 if it is also in anatomically defined BA17 or BA18, respectively. κ = 1 means the hypothesis is fully true, κ = 0 means functionally and anatomically defined visual areas are independent. When applying this measure to the probability maps, κ was equal to 0.84 for both V1/BA17 and V2/BA18. The data thus show a good correspondence of functionally and anatomically derived segregations of early visual processing areas and serve as a basis for employing anatomical probability maps of V1 and V2 in group analyses to characterize functional activations of early visual processing areas.</td></tr></tbody></table>
<li id="item-25485" class="item journalArticle"><h2>*Functional and anatomical properties of human visual cortical fields*</h2><table><tbody><tr class="creator author"><th class="author">Author</th><td>Shouyu Zhang</td></tr><tr class="creator author"><th class="author">Author</th><td>Anthony D. Cate</td></tr><tr class="creator author"><th class="author">Author</th><td>Timothy J. Herron</td></tr><tr class="creator author"><th class="author">Author</th><td>Xiaojian Kang</td></tr><tr class="creator author"><th class="author">Author</th><td>E. William Yund</td></tr><tr class="creator author"><th class="author">Author</th><td>Shanglian Bao</td></tr><tr class="creator author"><th class="author">Author</th><td>David L. Woods</td></tr><tr class="volume"><th class="volume">Volume</th><td>109</td></tr><tr class="issue"><th class="issue">Issue</th><td>Pt A</td></tr><tr class="pages"><th class="pages">Pages</th><td>107-121</td></tr><tr class="publicationTitle"><th class="publicationTitle">Publication</th><td>Vision Research</td></tr><tr class="date"><th class="date">Date</th><td>Apr 2015</td></tr><tr class="DOI"><th class="DOI">DOI</th><td>10.1016/j.visres.2015.01.015</td></tr><tr class="abstractNote"><th class="abstractNote">Abstract</th><td>*Human visual cortical fields (VCFs) vary in size and anatomical location across individual subjects. Here, we used functional magnetic resonance imaging (fMRI) with retinotopic stimulation to identify VCFs on the cortical surface. We found that aligning and averaging VCF activations across the two hemispheres provided clear delineation of multiple retinotopic fields in visual cortex. The results show that VCFs have consistent locations and extents in different subjects that provide stable and accurate landmarks for functional and anatomical mapping. Interhemispheric comparisons revealed minor differences in polar angle and eccentricity tuning in comparable VCFs in the left and right hemisphere, and somewhat greater intersubject variability in the right than left hemisphere. We then used the functional boundaries to characterize the anatomical properties of VCFs, including fractional anisotropy (FA), magnetization transfer ratio (MTR) and the ratio of T1W and T2W images and found significant anatomical differences between VCFs and between hemispheres.*</td></tr></tbody></table>
</body></html> </html>