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A toolbox for processing arterial spin labeling
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ASAP (Automatic Software for ASL Processing): A toolbox for processing Arterial Spin Labeling images

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Abstract

The method of Arterial Spin Labeling (ASL) has experienced a significant rise in its application to functional imaging, since it is the only technique capable of measuring blood perfusion in a truly non-invasive manner. Currently, there are no commercial packages for processing ASL data and there is no recognized standard for normalizing ASL data to a common frame of reference. This work describes a new Automated Software for ASL Processing (ASAP) that can automatically process several ASL datasets. ASAP includes functions for all stages of image pre-processing: quantification, skull-stripping, co-registration, partial volume correction and normalization. To assess the applicability and validity of the toolbox, this work shows its application in the study of hypoperfusion in a sample of healthy subjects at risk of progressing to Alzheimer's

disease. ASAP requires limited user intervention, minimizing the possibility of random and systematic errors, and produces cerebral blood flow maps that are ready for statistical group analysis. The software is easy to operate and results in excellent quality of spatial normalization. The results found in this evaluation study are consistent with previous studies that find decreased perfusion in Alzheimer's patients in similar regions and demonstrate the applicability of ASAP.



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Keywords

Arterial Spin Labeling; Cerebral blood flow; Automatic processing; Partial volume effect; Alzheimer's disease

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