**DEVELOPMENT OF SMALL MOLECULE LIGANDS TARGETING THE LYSOPHOSPHATIDIC ACID RECEPTOR 1 FOR PET IMAGING**

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**BACKGROUND/OBJECTIVES**: Lysophosphatidic acid receptors are a class of G protein coupled receptors responsible for a range of signaling functions, typically mediated by lysophosphatidic acid. Lysophosphatidic acid receptor 1 (LPA1) signals various processes such as cell motility, proliferation, and survival, as well as angiogenesis. Due to the significant upregulation of LPA1 in some types of cancer, it has high potential to be a target for positron emission tomography (PET) imaging agents. Using radiolabeled small molecules as imaging agents in PET is a relatively unexplored modality, and it could provide a means of quickly and efficiently imaging tumours with high contrast. Our group is focused on the development of novel small molecule LPA1 ligands to be radiolabeled and tested as imaging agents.

**METHOD**: Our current approach is to create a small library of analogues based on reported LPA1 antagonists through multi-step organic synthesis. Once a large enough library is created, ligand binding will be assessed in vitro and ligand structure will be optimized. Promising candidates will be radiolabeled and tested in vivo.

**RESULTS**: As of now we are developing novel ligands; most of our current work is focused on optimizing synthetic pathways and synthesizing more analogues. We have made significant progress in a multistep organic synthesis scheme, and plan on having more data to present by the end of august.



**CONCLUSION/IMPLICATION**: PET imaging agents developed to image tumours could have significant implications for cancer diagnosis and treatment. PET provides a quick and non-invasive means of taking good resolution images, and designing small molecule ligands could allow for imaging of cancer types inaccessible to other imaging modalities.

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