The project focuses on designing and developing of fluorescent probes for *in vivo* and *in vitro* detection of biomarkers associated with metabolic disorders linked to proline metabolism. Proline oxidation requires the proline dehydrogenase (ProDH) and P5C dehydrogenase (P5CDH). The project therefore aims to create innovative fluorescent probes to detect and monitor the activity of these key enzymes. Two complementary strategies are envisaged to achieve this goal. The 1st strategy is based on the formation of fluorescent adducts of glutamate semialdehyde (GSA) produced during proline oxidation by ProDH. The 2nd strategy involves the synthesis of C4-modified prolines capable of releasing fluorescent probes upon oxidation by ProDH. The identification of mitochondrial proline transporters is also envisioned through the synthesis of biotin-grafted prolines. This bi-disciplinary project will combine the expertise of two internationally recognized Sorbonne University teams in the fields of organometallic chemistry and synthesis of compounds of biological interest (ROCS team), and proline metabolism (APCE team). It will also provide high-level bi-disciplinary training for the PhD student recruited and assigned to the two teams to carry out the project.