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The Champalimaud Research (CR) unit is poised to lead transformative advances in science from 2025 to 2029, focusing on strong fundamental research in systems neuroscience and cancer biology, bridging toward clinical applications. The mission of CR is to deepen our understanding of complex biological systems through an integrative approach that, in our next phase, will focus particularly on advanced computational and artificial intelligence methods and cutting-edge -omics technologies.

Recognizing the importance and limitations of more reductionist neuroscience research methods, we are committed to developing neuro-behavioral foundation models. These models will integrate data from a consortium of international labs, aiming to construct comprehensive computational models for understanding the neural basis of behavior. This effort is complemented by our initiative to establish a new applied neuroscience institute, which will focus on developing digital therapeutics and fostering collaborations between researchers, clinicians, and the tech industry. In our journey towards unraveling the intricate interactions between genetic, cellular, and systemic factors in physiology and cancer, we aim to uncover how cell intrinsic characteristics and external influences shape health and disease. A cornerstone of our strategy is the development of a state-of-the-art -omics platform. This will enable groundbreaking work using single-cell and bulk DNA and RNA sequencing, along with spatial transcriptomics and metabolomics, in collaboration with the newly established translational research program in pancreatic cancer. This platform will not only enhance our research capabilities but also foster collaborations, driving forward our understanding of disease mechanisms and potential therapies.

To manage the vast amounts of data generated, we will bolster our computational infrastructure, recruiting experts in bioinformatics and machine learning. This will provide our researchers with rapid access to primary data and analytical tools, facilitating innovative experimental designs and the interpretation of complex datasets.

Our commitment extends beyond technological advancement to include a strong emphasis on international collaboration, advanced training, and the integration of research into clinical practice. We are dedicated to hosting major international conferences, partnering with leading research institutions, and offering advanced training courses in a variety of topics. Through these ambitious efforts, the CR unit seeks not only to advance scientific knowledge but also to contribute to the development of novel therapies, promote the transfer of knowledge and technology, and engage in actions of societal relevance. Our commitment to open access, gender equality, inclusiveness, and data privacy underlines our dedication to creating a fair and equitable scientific community, where diverse talents are harnessed to drive scientific progress and innovation.

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