Targeting RAS in cancer and RASopathies

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The overarching research goal of the Abankwa lab is to develop novel drug targeting strategies against the RAS pathway in cancer and individually rare but collectively common developmental diseases called RASopathies. Their research focuses on understanding how RAS drives stemness and differentiation, identifying novel RAS drug targets and mechanisms, and developing proof-of-concept drugs.

Relevant recent outputs include: the development of a nanomolar, highly water-soluble small molecule PDE6D inhibitor and its successor proof-of-concept construct with potential applications in regulating ciliary protein trafficking (1,2); the optimisation of peptidic protein-protein interface inhibitors targeting RAS (3); and the elucidation of how KRAS regulates stemness and cell differentiation from the primary cilium (4,5).

The group applies in silico screening to identify classical small molecules, protein-protein interface targeting small molecules and peptides/peptidomimetics. These molecular modalities are subsequently validated using quantitative fluorescence imaging, flow cytometry, biochemical and cellular assay development, and molecular cell biology methods. The group also developed several FRET- and BRET-biosensors for the detection of functional membrane anchorage of small GTPases and Src-family proteins, as well as for various interactions in the Ras pathway.

The lab aims at applications in cancer, RASopathies and stem cell / regenerative biology.

References

1. Kaya P, Schaffner-Reckinger E, Manoharan GB, et al. An Improved PDE6D Inhibitor Combines with Sildenafil To Inhibit KRAS Mutant Cancer Cell Growth. J Med Chem 2024;67(11):8569-8584.

2. Gomez-Mulas A, Schaffner-Reckinger E, Peeters H, et al. Development of a Genetically Encoded and Potent PDE6D Inhibitor. Chembiochem 2025;26(24):e202500739.

3. Steffen CL, Manoharan GB, Pavic K, et al. Identification of an H-Ras nanocluster disrupting peptide. Commun Biol 2024;7(1):837.

4. Chippalkatti R, Schaffner-Reckinger E, Gaigneaux A, et al. K-Ras controls asymmetric cell divisions from the primary cilium. Cell Death Dis 2026.

5. Chippalkatti R, Parisi B, Kouzi F, Laurini C, Ben Fredj N, Abankwa DK. RAS isoform specific activities are disrupted by disease associated mutations during cell differentiation. Eur J Cell Biol 2024;103(2):151425.

Biosketch

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CURRENT AND PAST POSITIONS

Research Scientist, Department of Health, Medicine and Life Sciences, University of Luxembourg (UL), research group of Professor Dr Daniel Abankwa.

EDUCATION

1995-1998: PhD "Structure et Fonctionnement des Systèmes Biologiques Intégrés", Université de Paris-Sud XI (mention très honorable avec les félicitations du jury).

1994-1995: Diplôme d'Études Approfondies (D.E.A.) "Structure et Fonctionnement des Systèmes Biologiques Intégrés", Université de Paris-Sud XI.

1989-1993: Diplôme d'Études Supérieures de Sciences Naturelles, Biologie, ETH Zurich.

AWARDS AND HONORS

2003: Young Investigator Award, XIX Congress of the International Society on Thrombosis and Haemostasis (ISTH).

2016-2020: PI, "Analysis of the signal transduction network upstream of L-plastin Ser5 phosphorylation in breast cancer cells and tissues", €250,000, Fondation Cancer.

2012-2016: PI, "Molecular circuits linking L-plastin phosphorylation to breast cancer progression", €105,075, Internal Research Project, UL.

2011-2014: PI, "Tes, a cancer-associated LIM-domain protein and novel actin nucleator with a dual function in the cytoplasm and the nucleus", €161,000, FNR-INTER project with Prof. Dr Christophe Ampe, Ghent University.

1995-1998: Bourse Formation-Recherche, Ministère de l'Éducation Nationale et de la Formation Professionnelle, Luxembourg.

OTHER RELEVANT PROFESSIONAL ACTIVITIES AND ACCOMPLISHMENTS

Teaching activities: Molecular Biology (Life Sciences Bachelor) and Cytology (Midwifery Bachelor), UL. Supervision activities: 1 Postdoc, 1 PhD student, 9 Master students, 9 Bachelor students; member of CETs, PhD and MSc theses examination committees. Member of the University Council, UL. Deputy director of the Doctoral Program in Systems and Molecular Biomedicine, UL. Scientific direction, administration, and staff supervision at the Cytoskeleton lab, LSRU, FSTM, UL (2012-2017). Organization of scientific outreach activities.