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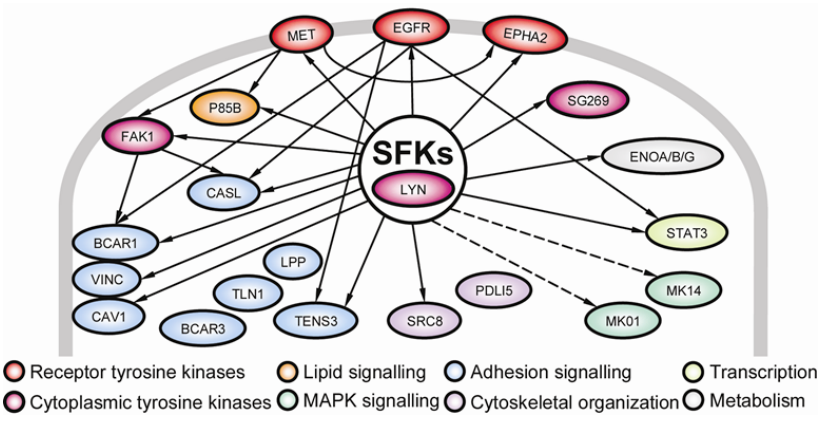
Perturbations in cellular signalling play a fundamental role in human cancer and provide the rationale for many targeted therapies. The goal of the Signalling Network Laboratory is to characterize at the molecular level how signalling is altered in cancer, and thereby identify novel therapeutic strategies for particular poor prognosis human cancers, as well as biomarkers that aid classification of patients towards optimal treatments. Ultimately this work will lead to improved treatments for cancer patients with resulting reductions in morbidity and mortality. We utilise a variety of molecular, cellular and biochemical techniques, including mass spectrometry (MS)-based phosphoproteomics and kinomics, siRNA library screens, cellular imaging and protein-protein interaction analysis. In addition, bioinformatic approaches are used to analyse our datasets and integrate these with publically-available data from cancer genome studies and functional genomic screens.

Research Projects

1. **Characterization of the SgK269 and SgK223 pseudokinase scaffolds**
2. **Definition and functional characterization of the Src-regulated kinome**
3. **Novel oncogenic drivers, therapeutic targets and biomarkers in prostate cancer**



Schematic of Src-regulated signalling network in basal/triple negative breast cancer.

Selected significant publications:

1. Humphrey ES, Su SP, Nagrial AM, Hochgräfe F, Pajic M, Lehrbach GM, Parton RG, Yap AS, Horvath LG, Chang DK, Biankin AV, Wu J, **Daly RJ**. 2016. Resolution of novel pancreatic ductal adenocarcinoma subtypes by global phosphotyrosine profiling. *Mol Cell Proteomics* pii: mcp.M116.058313 [Epub ahead of print]

2. Fleuren ED, Zhang L, Wu J, **Daly RJ**. 2016. The kinome 'at large' in cancer. *Nat Rev Cancer* 16(2):83-98

3. Croucher DR, Hochgräfe F, Zhang L, Liu L, Lyons RJ, Rickwood D, Tactacan CM, Browne BC, Ali N, Chan H, Shearer R, Gallego-Ortega D, Saunders DN, Swarbrick A, **Daly RJ**. 2013. Involvement of Lyn and the atypical kinase SgK269/PEAK1 in a basal breast cancer signaling pathway. *Cancer Res* 73(6):1969-80

4. Zheng Y, Zhang C, Croucher DR, Soliman MA, St-Denis N, Pasculescu A, Taylor L, Tate SA, Hardy WR, Colwill K, Dai AY, Bagshaw R, Dennis JW, Gingras AC, **Daly RJ**, Pawson T. 2013. Temporal regulation of EGF signalling networks by the scaffold protein Shc1. *Nature*. 499(7457):166-71.

5. Hochgrafe F, Zhang L, O'Toole SA, Browne BC, Pinese M, Porta Cubas A, Lehrbach GM, Croucher DR, Rickwood D, Boulghourjian A, Shearer R, Nair R, Swarbrick A, Faratian D, Mullen P, Harrison DJ, Biankin AV, Sutherland RL, Raftery MJ, **Daly RJ**. 2010. Tyrosine phosphorylation profiling reveals the signaling network characteristics of Basal breast cancer cells. *Cancer Research*. 70(22):9391-401.