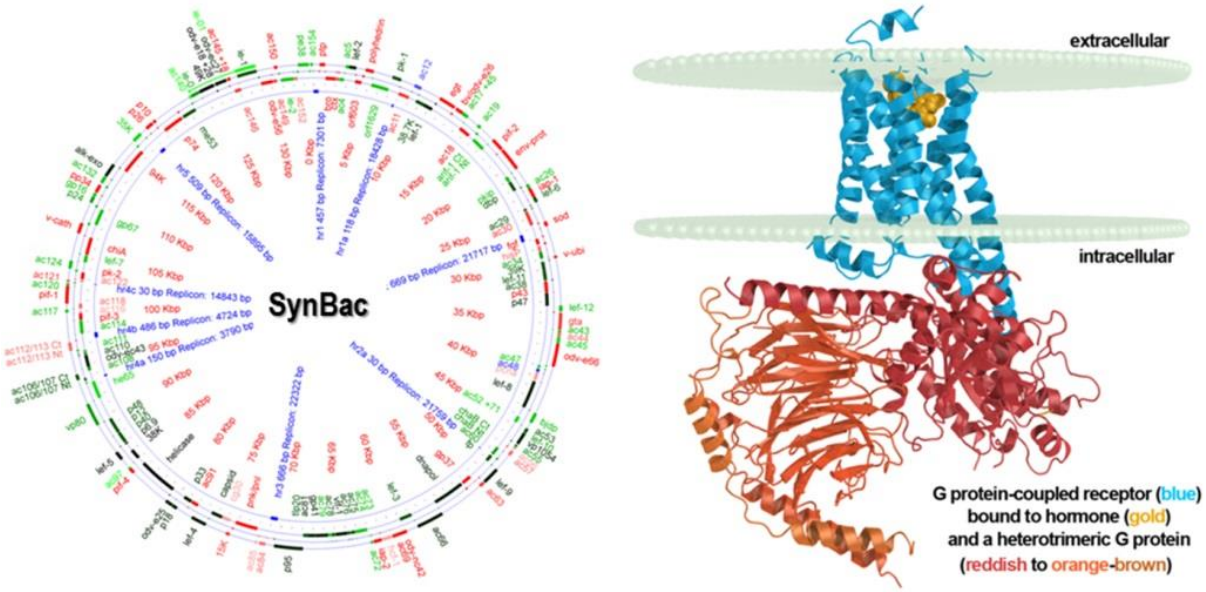
***** PhD and Post-Doc positions in Berger group, University of Bristol, UK *****

Synthetic Signaling Cascades:
New Tools for Next-Generation Drug Discovery

Signaling systems allow the cell to perceive its environment to control and coordinate cellular activities accordingly. Cellular signaling systems are the target for the majority of clinically used medicines. However, development times for new intervention strategies are excessively long, with associated high costs, and effective screening platforms for high-value applications are markedly lacking.

The Berger group in Bristol is part of **SynSignal**, an EU funded project that addresses these issues by providing new and sophisticated synthetic biology tools to overcome the challenges facing signaling-based development and innovation (www.synsignal.eu).

Funded by SynSignal, **positions are available immediately** that combine state-of-the-art genome engineering, with cutting-edge biochemistry and imaging technology to create GPCR/G-proteins/Arrestin-based synthetic signaling pathways for next-generation drug discovery. The project builds on advanced eukaryotic multigene delivery tools we have developed [1-5], for highly efficient transduction of a wide range of cell-types including primary cells.



The Berger group develops synthetic biology tools to recreate cellular signaling cascades.

These tools will be optimized by employing recent recombineering and editing techniques (CRISRP/Cas9) and implemented in BRET-based assays with our industrial partner in SynSignal, Geneva Biotech (www.geneva-biotech.com), including secondments.

A collaborations with Simone Weyand's team at the University of Cambridge UK (www.bioc.cam.ac.uk/people/uto/weyand), a leader in GPCR structural biology, is in place for biochemical and structural studies of the signaling cascades created.

Bristol is a **Centre for Synthetic Biology** in UK (BrisSynBio, www.bristol.ac.uk/brissynbio/) and excellent equipment and know-how in newly refurbished laboratories are available. Experience with current DNA recombineering methods (Gibson, redET, TR) and/or gene editing tools (CRISPR/Cas) are highly desirable. Experience with complex multicomponent cellular signaling modules (e.g. GPCR/G-proteins/Arrestin) is a definite plus.

In a dynamic and interdisciplinary team, integrated in BrisSynBio and tightly interacting with our academic and industrial partners in SynSignal, you will:

- Implement a development program consisting of i) Design & Engineering, ii) DNA Assembly and Protein Production, and iii) Testing to accumulate a toolbox of synthetic parts, cell lines, and complete signaling circuits.
- Develop tools for this signaling toolbox with broad combinatorial potential applicable for different types of signaling cascades.
- Develop whole synthetic signaling pathways based on GPCRs, G-proteins and Arrestins, which are applicable as screening platforms for new medicines, particularly Cancer and Diabetes.
- Characterize these synthetic signaling pathways with state-of-the-art imaging and BRET-based assays including small molecule ligand screening.

Please contact Prof. Imre Berger (imre.berger@bristol.ac.uk) for further information. We are seeking to fill the posts as soon as possible.

References:

1. Berger et al, ***Nature Biotechnology*** 2004 22(12):1583-7.
2. Fitzgerald et al, ***Nature Methods*** 2006 3(12):1021-32.
3. Bieniossek et al, ***Nature Methods*** 2009 Jun;6(6):447-50.
4. Reich et al. ***Nature*** 2014 Dec 18;516(7531):361-6.
5. Berger & Poterszman. ***Bioengineered*** 2015 [Epub ahead of print] PMID:26488462

Keywords:
Synthetic Biology, Cellular Signaling, Genome Engineering, MultiBac, GPCR, Imaging, Biochemistry, Biotechnology, Molecular Biology, Structural Biology

Bristol – Number 1 UK city to live in (*The Independent*, 2014)