Our philosophy: We are a group of individuals who love what we do. We are ambitious, back each other, and believe we are making a difference with our contribution to science and technology.

Research interests: Research in our group in two focus areas –

1. Molecular engineering: We engineer proteins and peptides with interesting properties for a number of different applications.

2. Very early human placental development: We use human pluripotent stem cells to make in vitro models that enable quantitative analysis.

Examples of recent work are discussed below.

Molecular Engineering

How to engineer proteins efficiently?
We have used proteins from organisms that grow under extreme high temperatures as “templates” for making specific binders.
We have developed a methodology to generate binding proteins for difficult to express binding proteins.
https://doi.org/10.1021/acscombsci.9b00147

Engineering proteins to make biosensors for live cell imaging
We have used engineered proteins to make biosensors for live cell imaging
https://doi.org/10.7554/eLife.50571
https://doi.org/10.1126/scisignal.aap7584

A complete list of publications can be found at
https://scholar.google.com/citations?hl=en&user=IPVVQvQAAAAJ&view_op=list_works&sortby/pubdate

Very early human placental development

Why do we need to study the human placenta?
The placenta is a critical organ that supports fetal development during pregnancy. Abnormalities in very early placental development can lead to pregnancy complications such as preeclampsia and pre-term birth. Yet, early human placental development is poorly understood due to restrictions on research with fetal tissue, and significant differences in placental development between humans and experimental animals.

We are using human pluripotent stem cells (human embryonic stem cells (hESCs) and human induced pluripotent stem cells (hiPSCs)) to generate in vitro models of the early human placenta.

We have shown that bona fide cells of the placental lineage can be obtained by differentiation of hESCs
https://doi.org/10.1074/jbc.M114.620641

We have derived human trophoblast stem cells from hESCs and hiPSCs.
https://doi.org/10.1101/762542