

## NRP Endocrine Disruptors

### Final Summary

Original project title <b>Signaling of estrogenic endocrine disruptors through membrane-associated receptors</b>
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### Unorthodox molecular responses

*Baker's yeast may be turned into a living test tube to monitor environmental samples for substances that affect mammalian physiology by acting through cell membrane-associated receptors. Moreover, we identified the genes that are activated in a breast cancer cell line by such signals.*

### Research questions

Endocrine disruptors have multiple molecular targets. Characterizing these targets is essential to understand the physiological effects of these substances. While one class of intracellular factors have been largely recognized as mediators of the effects of endocrine disruptors, cell membrane-associated receptor proteins have been neglected. We therefore proposed to generate a set of baker's yeast strains as a simple and cheap bioassay kit for signaling by endocrine disruptors through membrane-associated receptors. To improve our knowledge of the physiological consequences of signaling through such membrane receptors, we used a human breast cancer cell line as a model system and identified the genes that are activated in response to such hormonal signals.

### Results

Two types of molecular targets of endocrine disruptors have been functionally transplanted into baker's yeast. Preliminary results are promising and indicate that a yeast-based simple, rapid, and cheap bioassay kit could be developed to monitor environmental samples and to complement existing kits that detect substances that act through other molecular targets. At the molecular level, the physiological pendant in human breast cancer cells turns out to be an interesting list of genes that are activated by hormonal signals. Some of these genes may be responsible for the stimulatory effects in these cells.

## Perspectives

The researcher's toolbox will be complemented with a new set of yeast biodetectors for endocrine disruptors. New insights into the genomic response of breast cancer cells will help both basic and applied research into the molecular mechanisms of endocrine disruptors.