



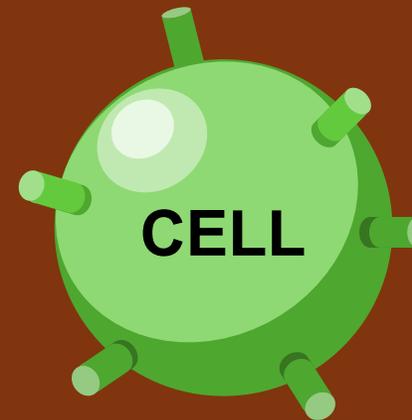
UNIVERSITY OF
BATH



Dr Maria Shchepinova
Lecturer in Chemical Biology

Department of Chemistry

**WHERE CHEMISTRY MEETS BIOLOGY
TO UNLOCK BETTER HEALTH**

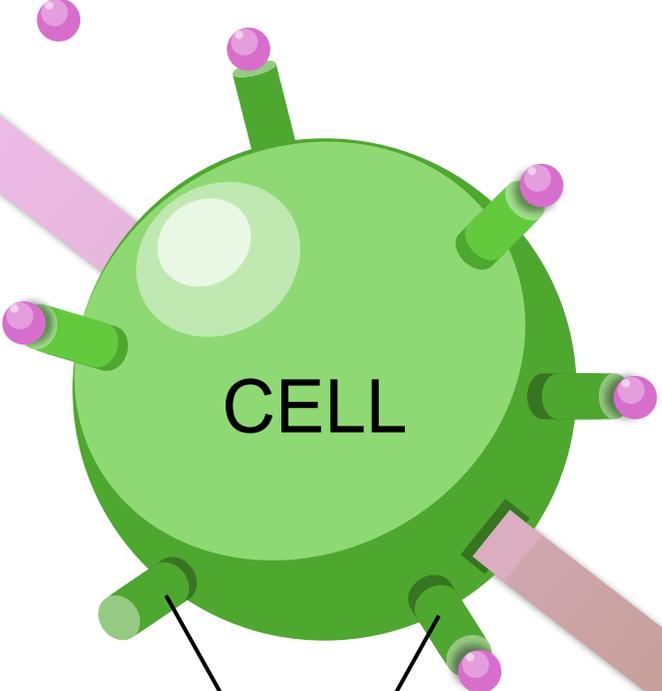
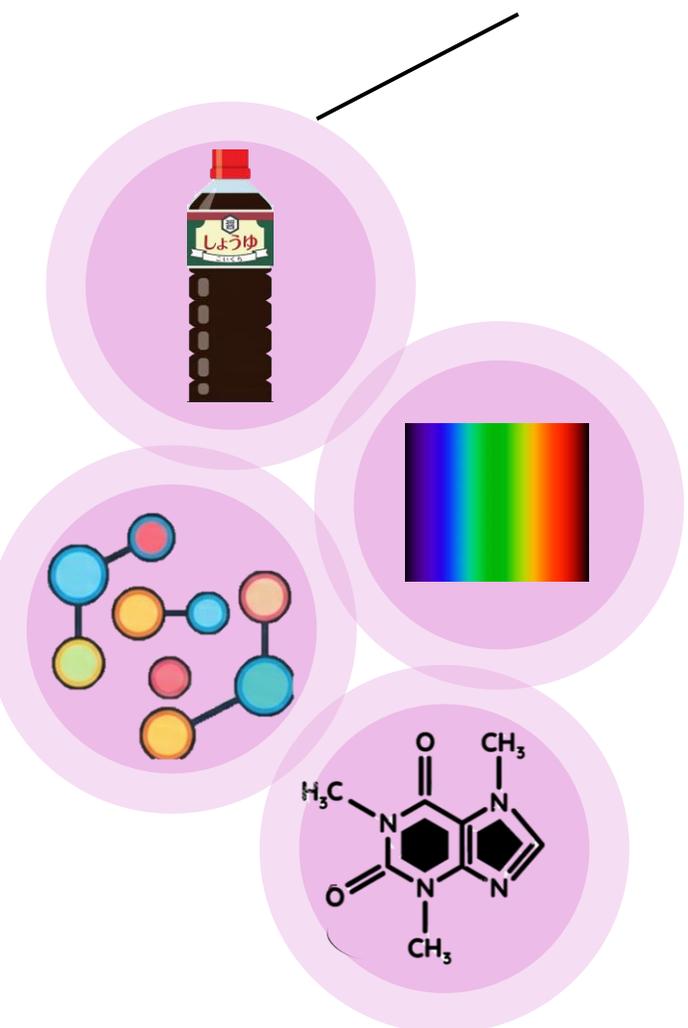


University of Bath Research Day

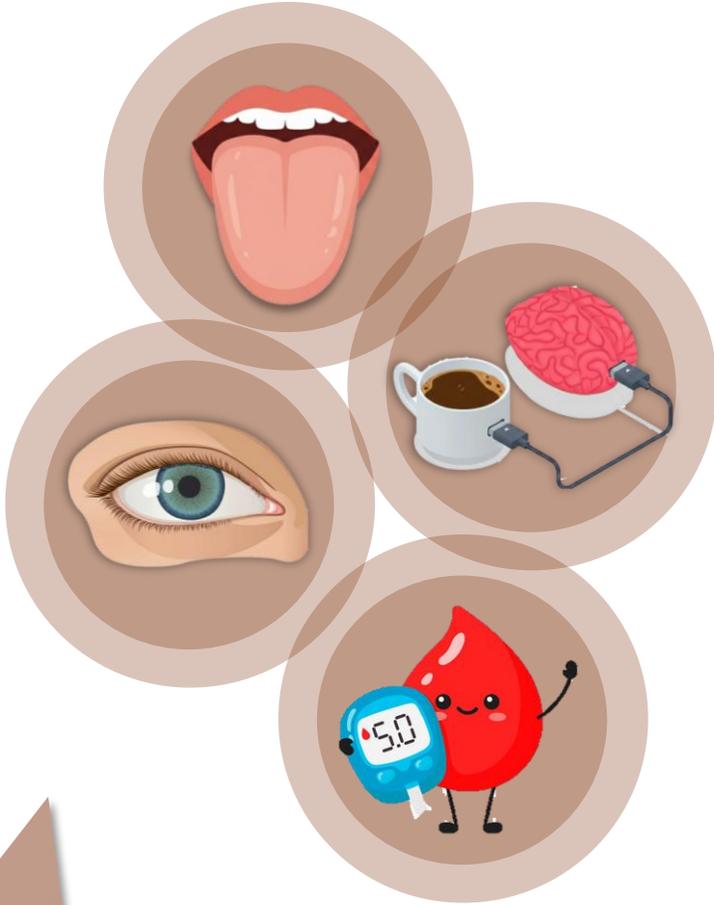
Tuesday 17 February 2026

GPCRs on the LOOKOUT: SENSE, TRANSMIT and CONTROL

STIMULI

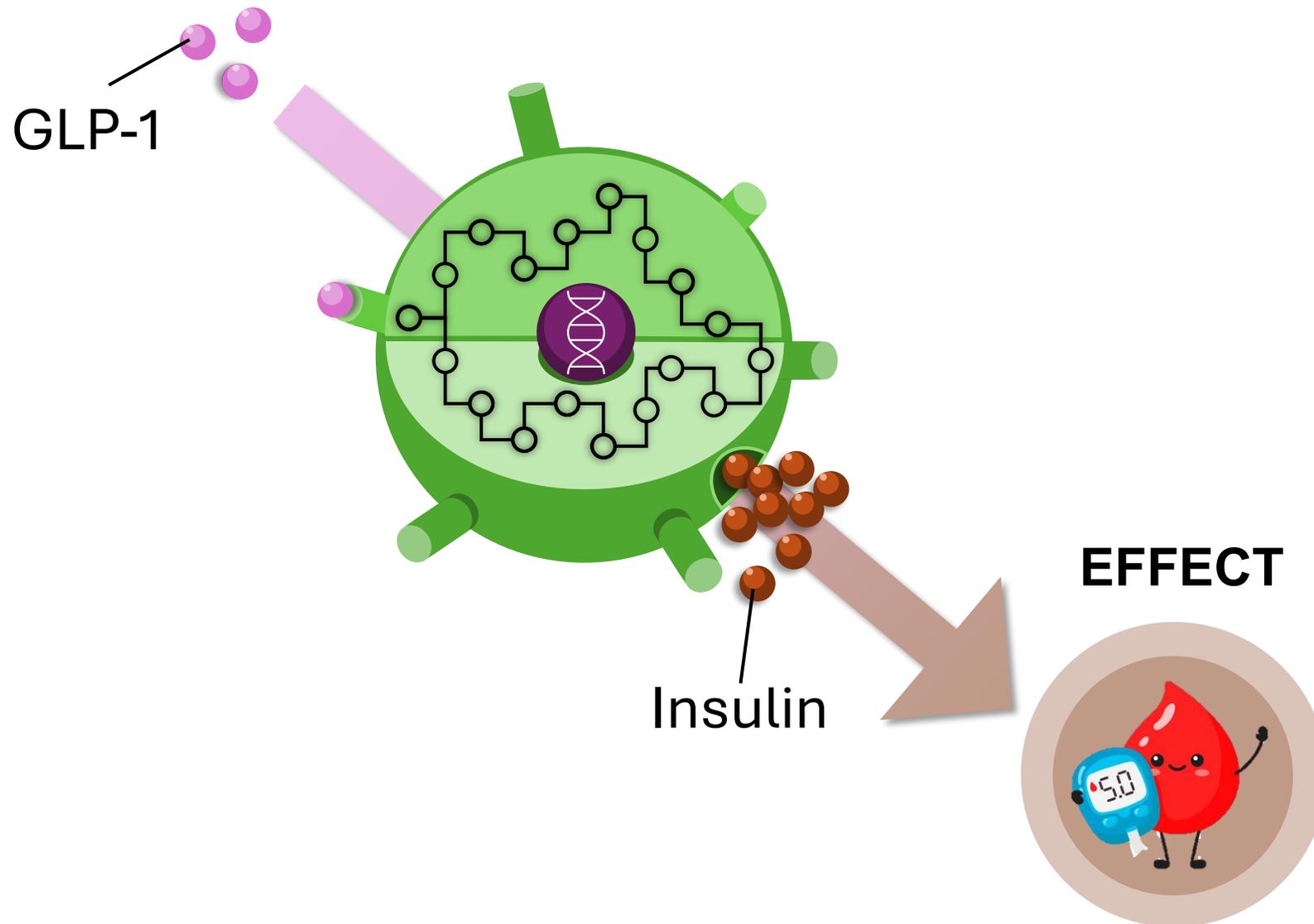


Protein sensors
(GPCRs)

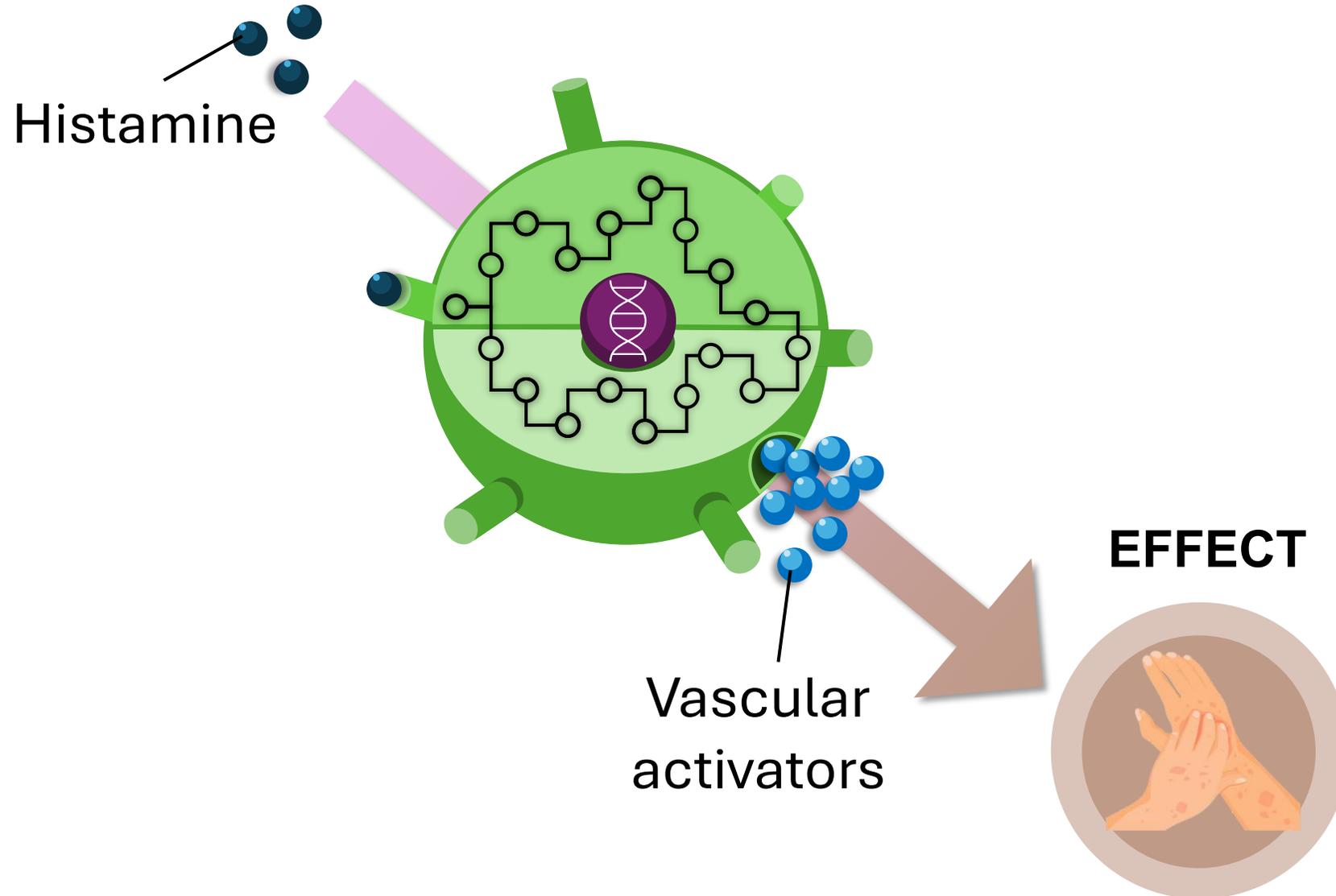


EFFECT

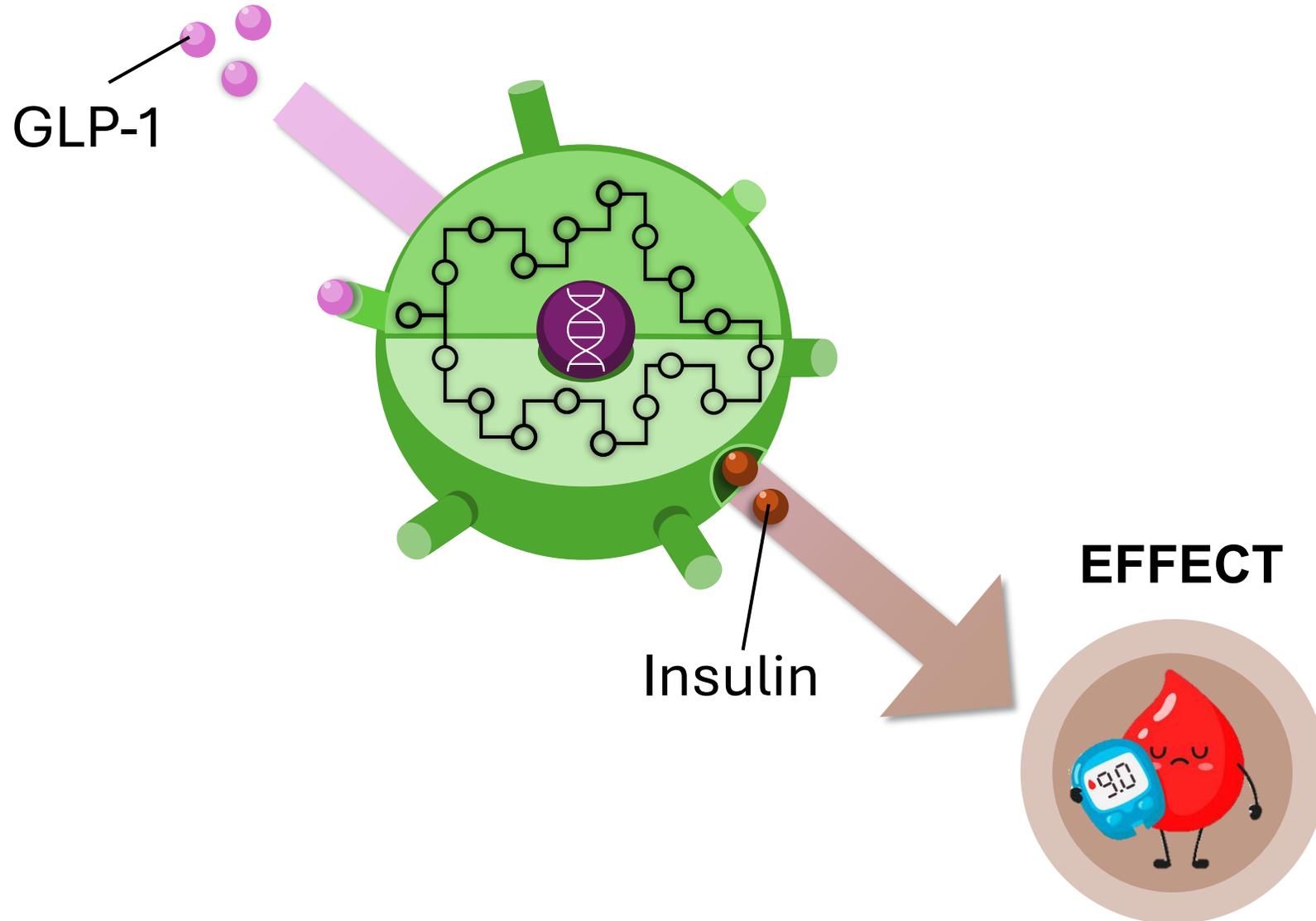
HOW DO GPCRs DO WHAT THEY DO?



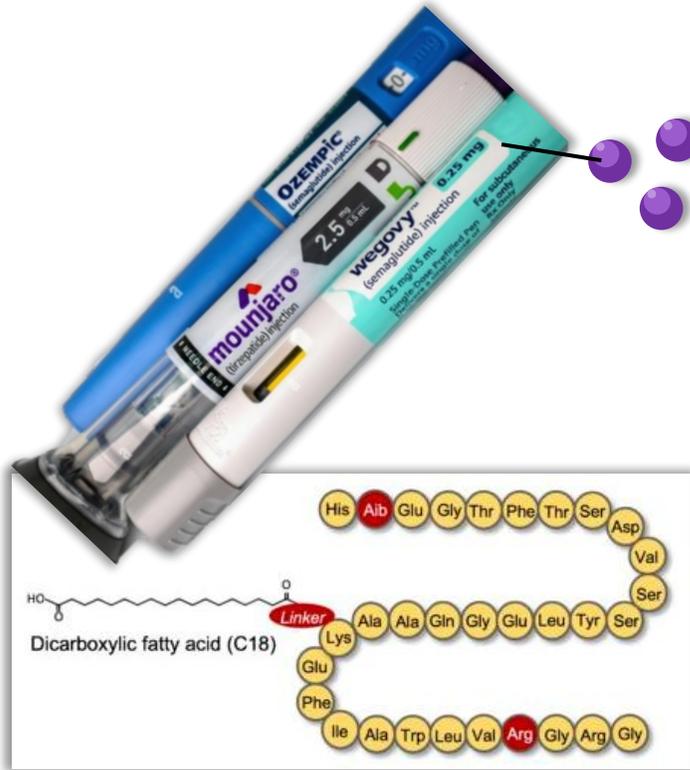
HOW DO GPCRs DO WHAT THEY DO?



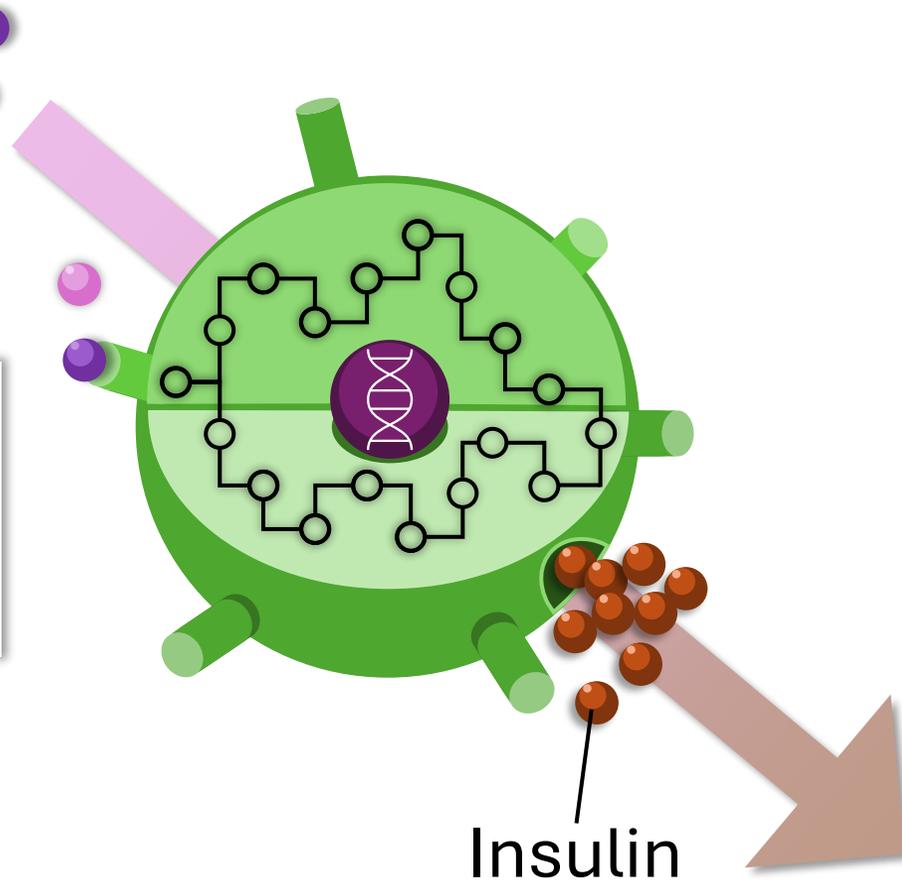
GPCRs ARE the MOST POPULAR DRUG TARGETS!



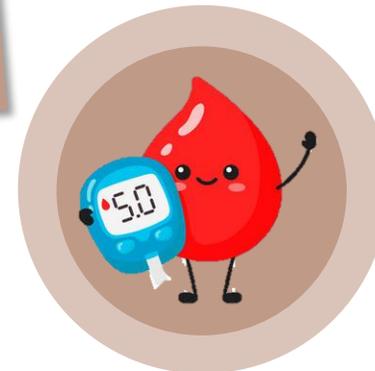
GPCR-TARGETING DRUGS: OZEMPIC



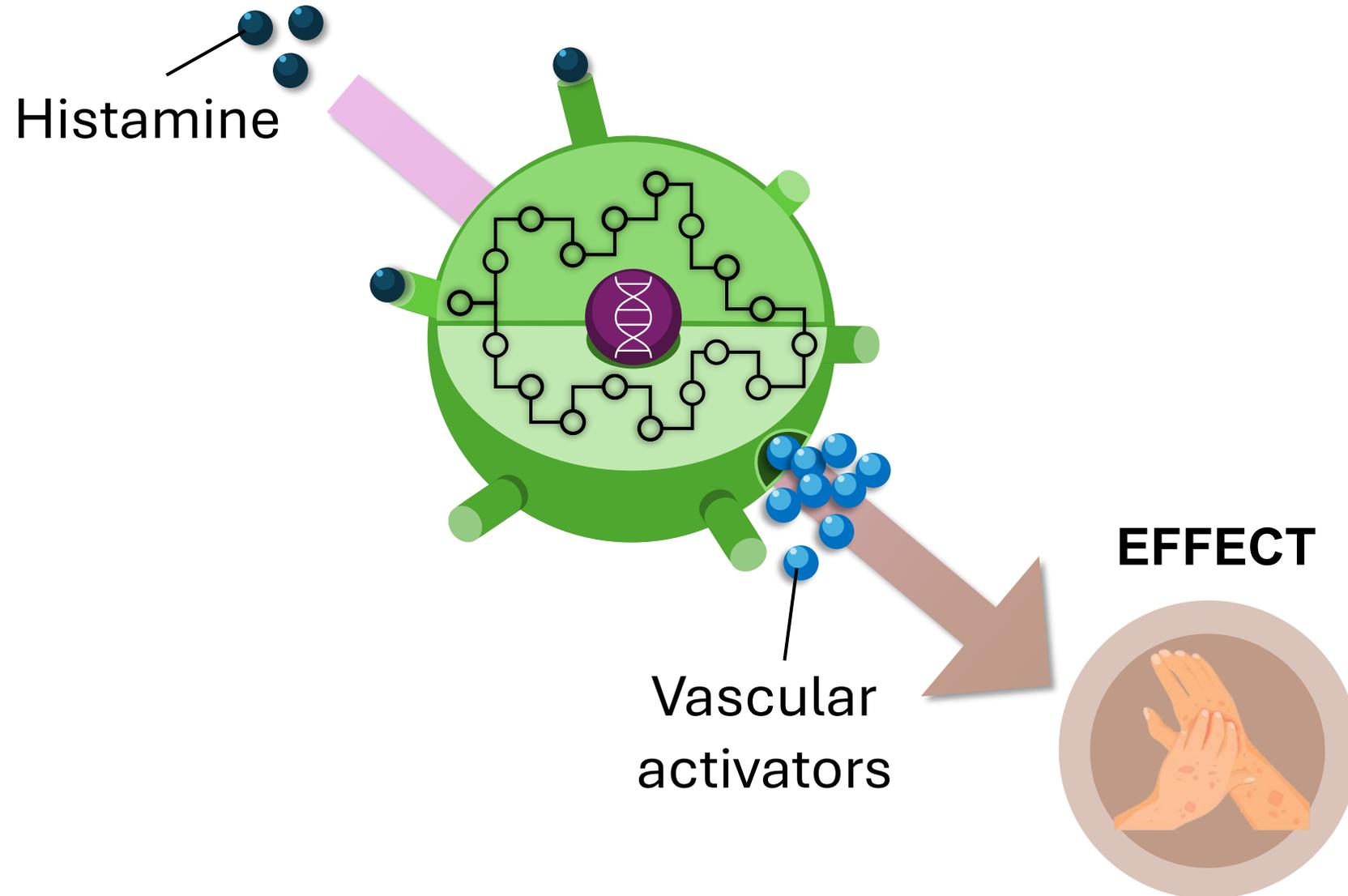
Ozempic
Mounjaro
Wegovy



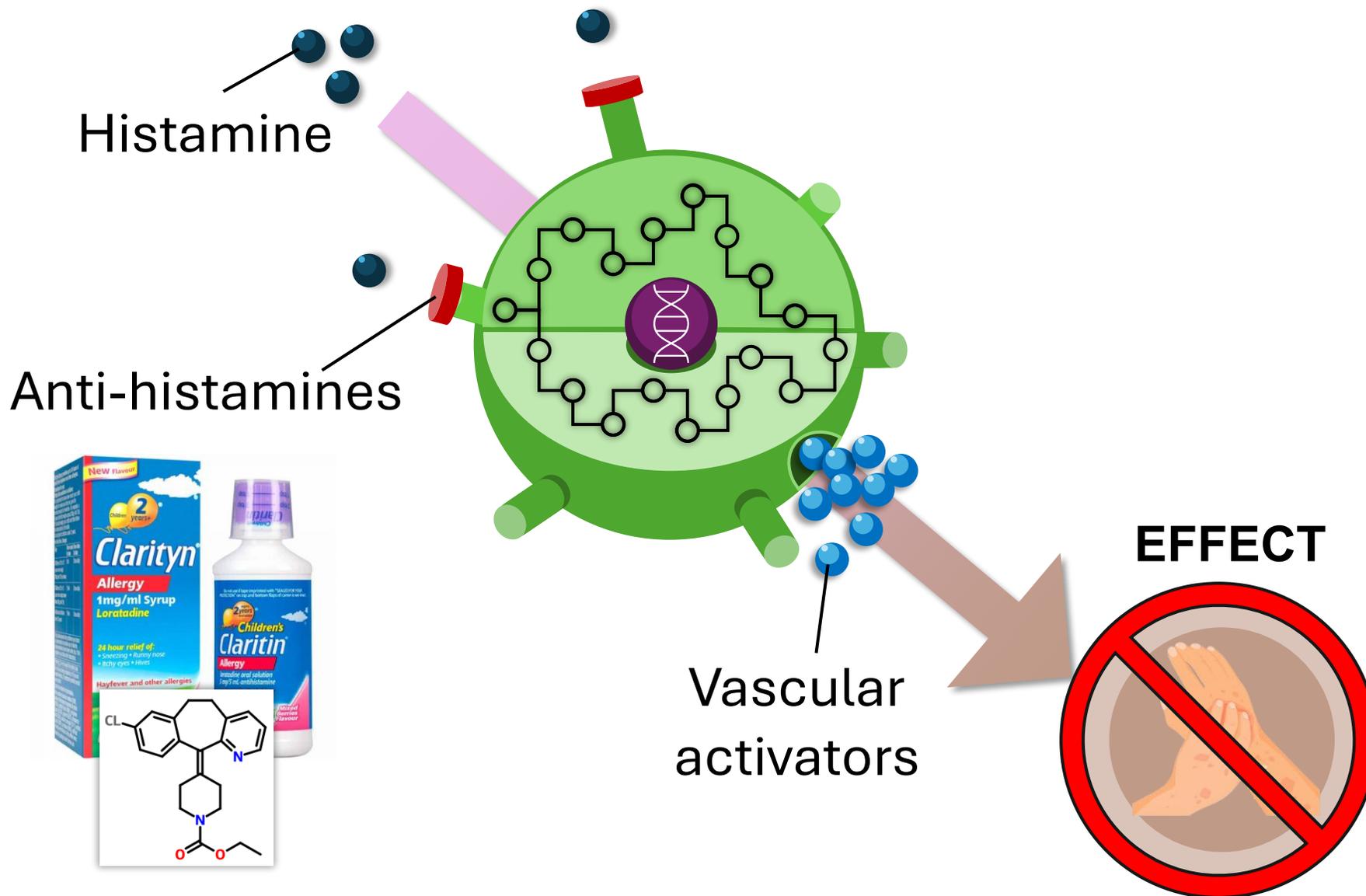
EFFECT



GPCR-TARGETING DRUGS: ANTI-HISTAMINES



GPCR-TARGETING DRUGS: ANTI-HISTAMINES

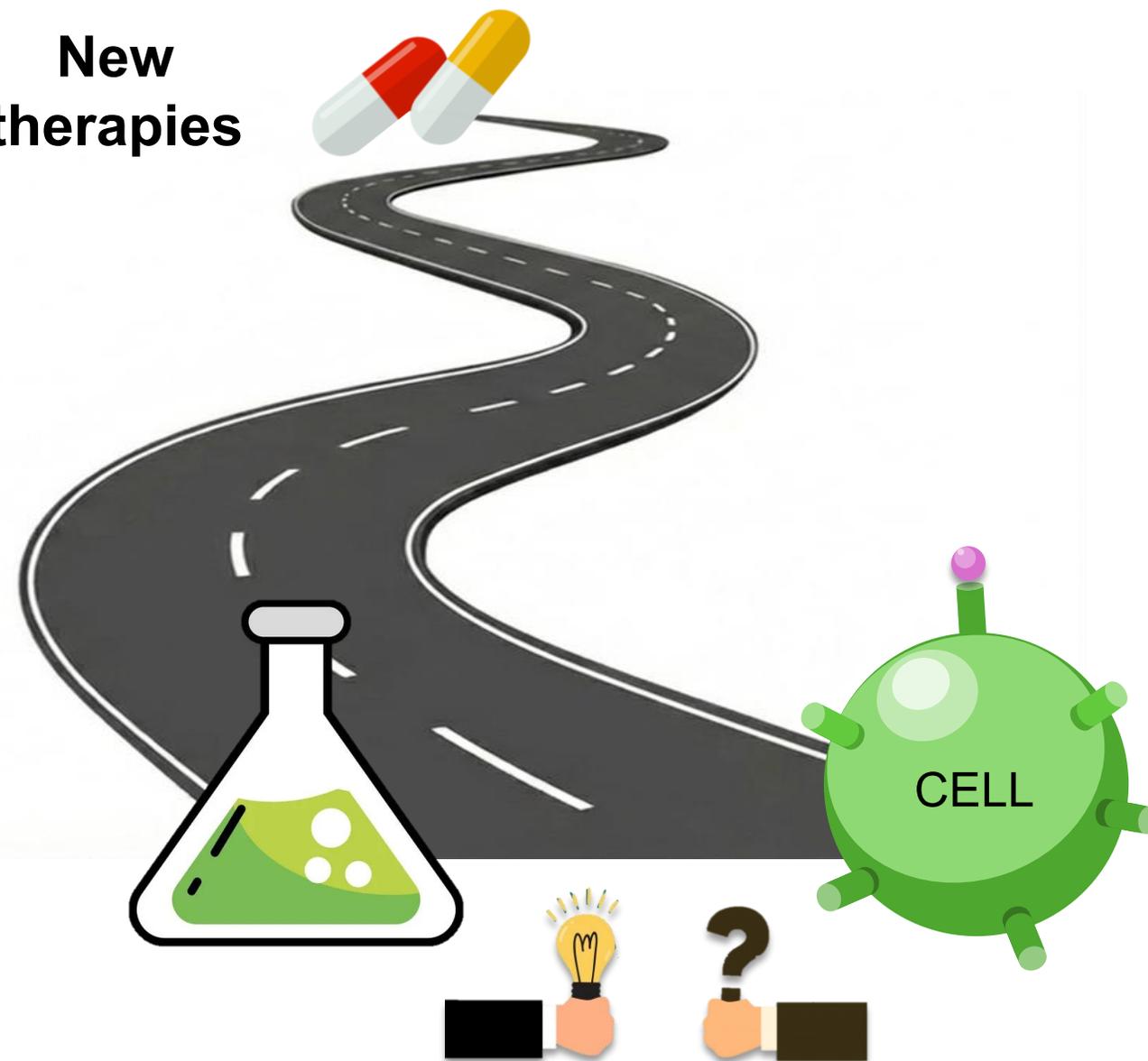


SHCHEPINOVA LAB @ BATH: CHEMICAL BIOLOGY & GPCRs

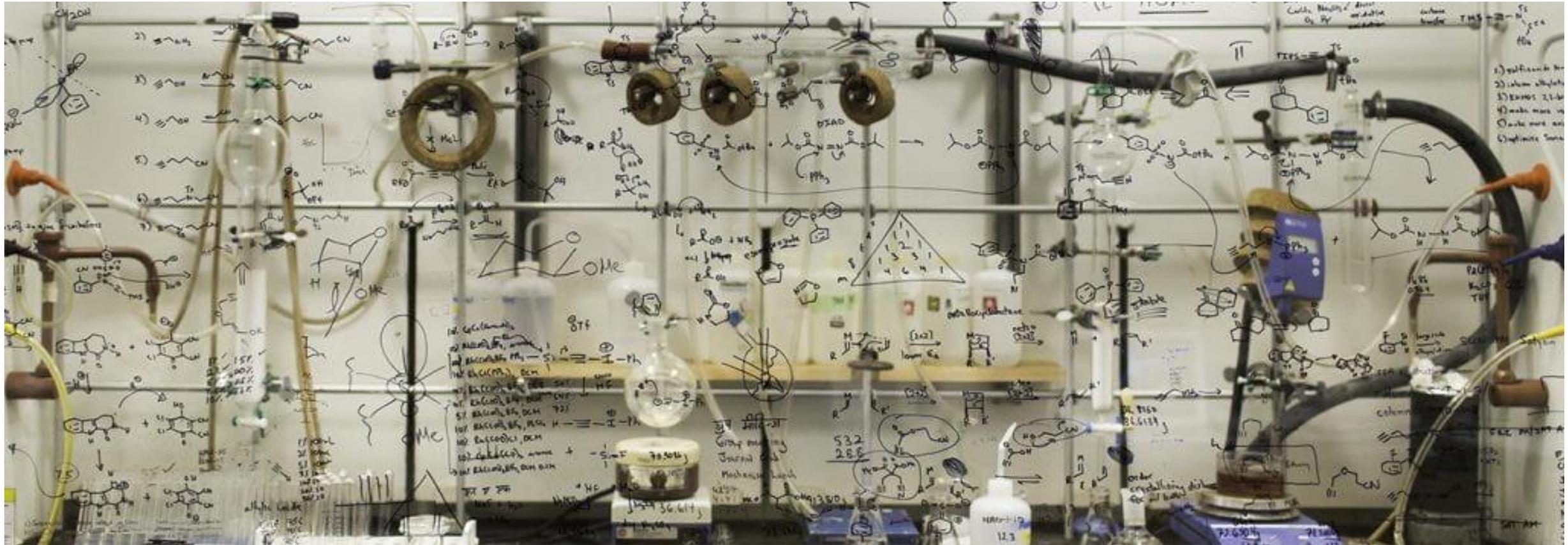


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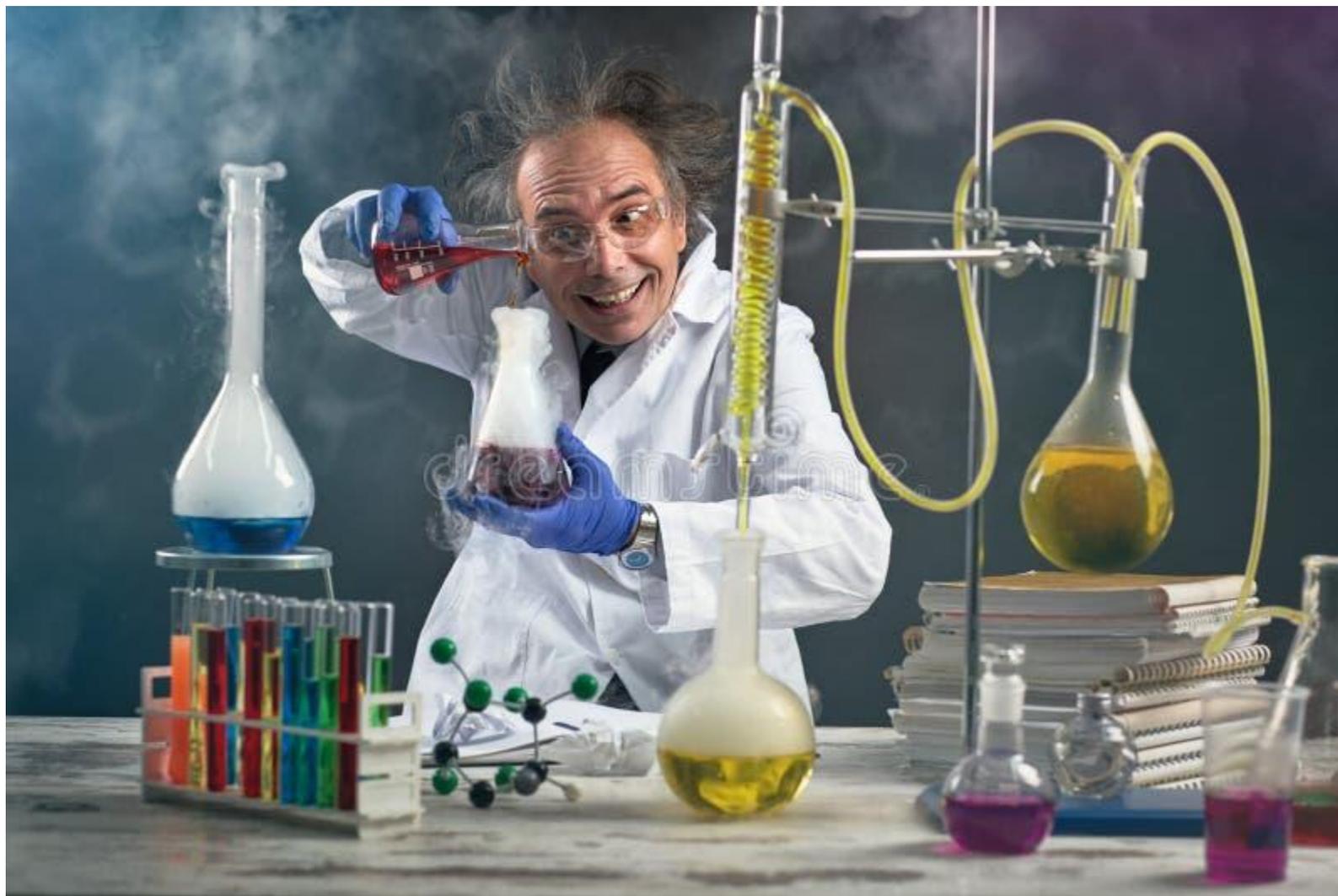
**New
therapies**



HOW CHEMISTRY HELPS BIOLOGY?



Chemistry is not (always) just that...



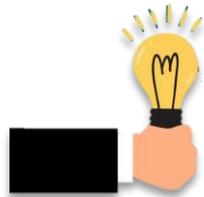
Or that!

CHEMICAL TOOLBOX for GPCRs: CHEMICAL BIOLOGY

When **chemistry** is applied to study how **biological systems** work, this field of research is called **chemical biology**.

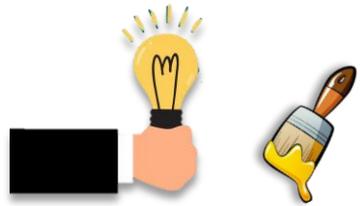
Chemistry provides a unique **toolbox** to probe and manipulate biology, paving the way towards **new therapies and drugs**.

CHEMISTRY

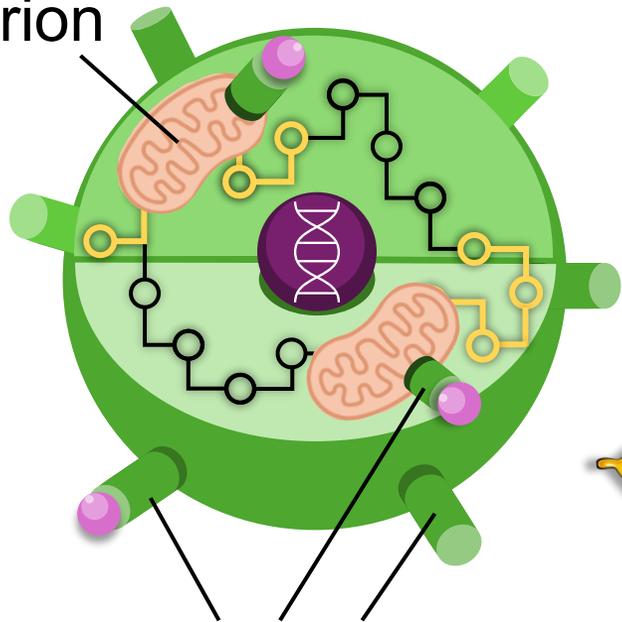


BIOLOGY

CHEMICAL TOOLBOX 1: TARGETING GPCRs on ORGANELLES

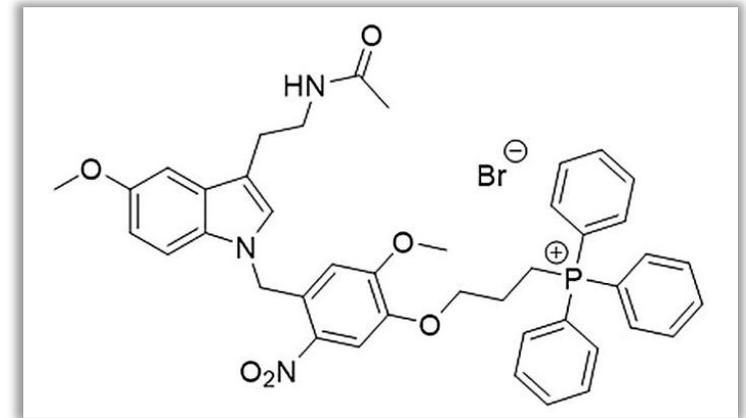


Mitochondrion



GPCRs

What do mitochondrial GPCRs do in the cell?



PMID: 37572668

Chemical tool – a molecule



PROJECT 1. Organelle-specific chemical biology

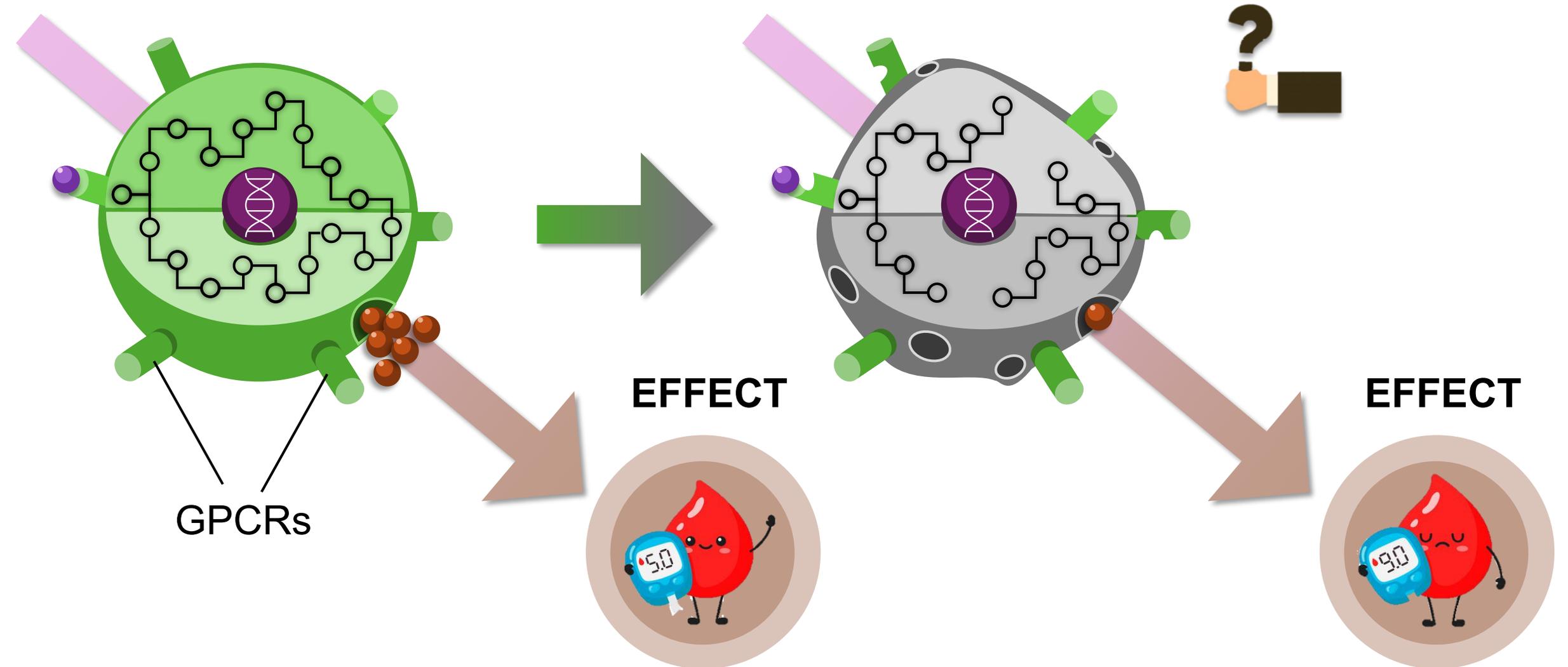


PRECISION MEDICINE: treating diseases by targeting GPCRs on **specific organelles**

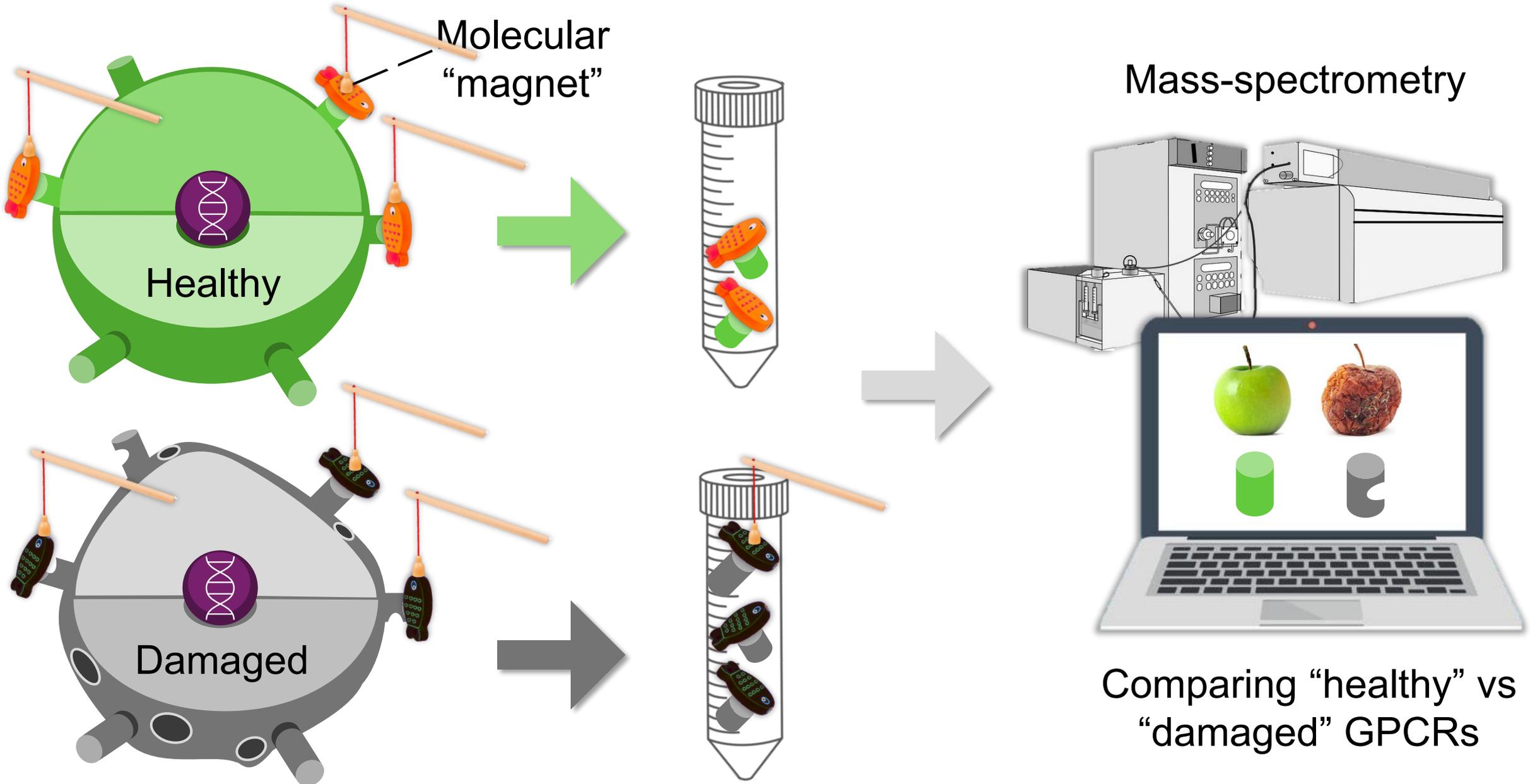
GPCRs and OXIDATIVE STRESS in METABOLIC DISEASE

- Oxidative radicals

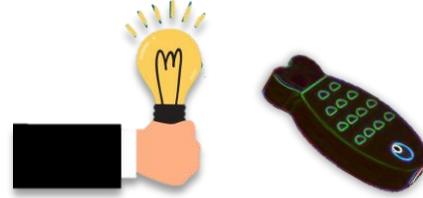
How exactly are GPCRs “damaged”?
Do the drugs still work on “damaged” GPCRs?



CHEMICAL TOOLBOX 2: MOLECULAR “MAGNETS” for GPCRs



PROJECT 2: TOWARDS PERSONALIZED MEDICINES



Chemical tool – a molecule that reports on how exactly GPCRs are damaged



PROJECT 2: New area of research in metabolic disease



PERSONALIZED MEDICINE: if we know how “damaged” GPCRs work, we can **design new drugs** that work even on “damaged” GPCRs and **tailor** them for each patient’s needs

NEW DRUG DISCOVERY CENTRE @ BATH

Bath Centre for Drug Discovery (BCDD) launching in March 2026

*The Centre will focus on **early-stage drug discovery** to generate partner-ready discovery assets – validated targets, screening platforms, and chemical leads – for subsequent **development with industry and translational funders***

“Discovery engine in South West”



Dr A. Cresswell Dr S. Lovell

11 members of SAB

Strong links between Life Sciences and Chemistry!



CANCER RESEARCH UK

