

Quantifying the Biological Activity of Thermally Stressed Insulins In Vitro



DCB

IN
SPIRE
LAB

u^b
UNIVERSITÄT
BERN

gcb

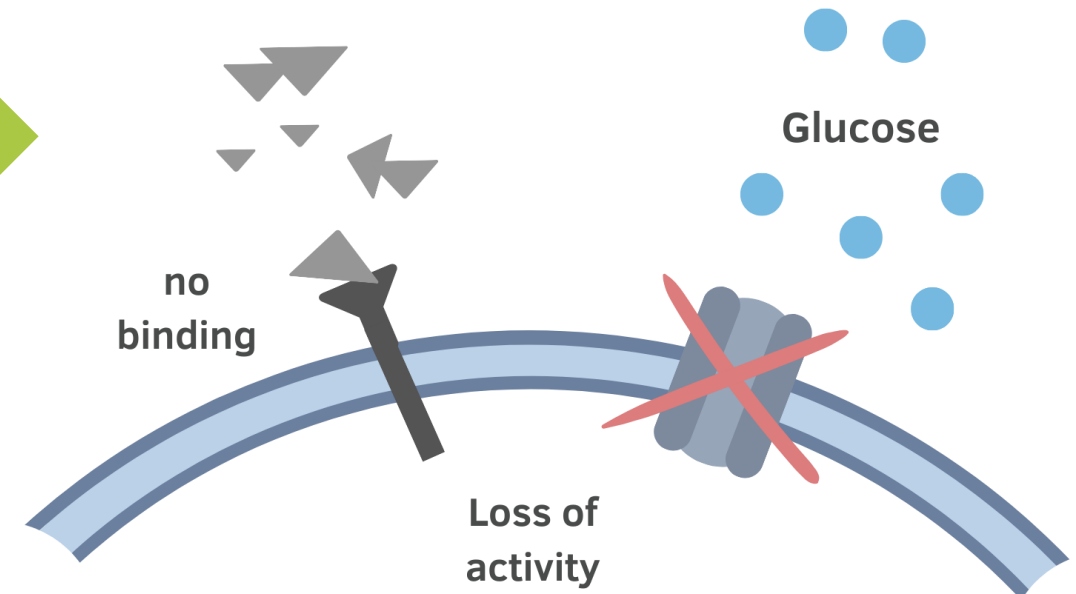
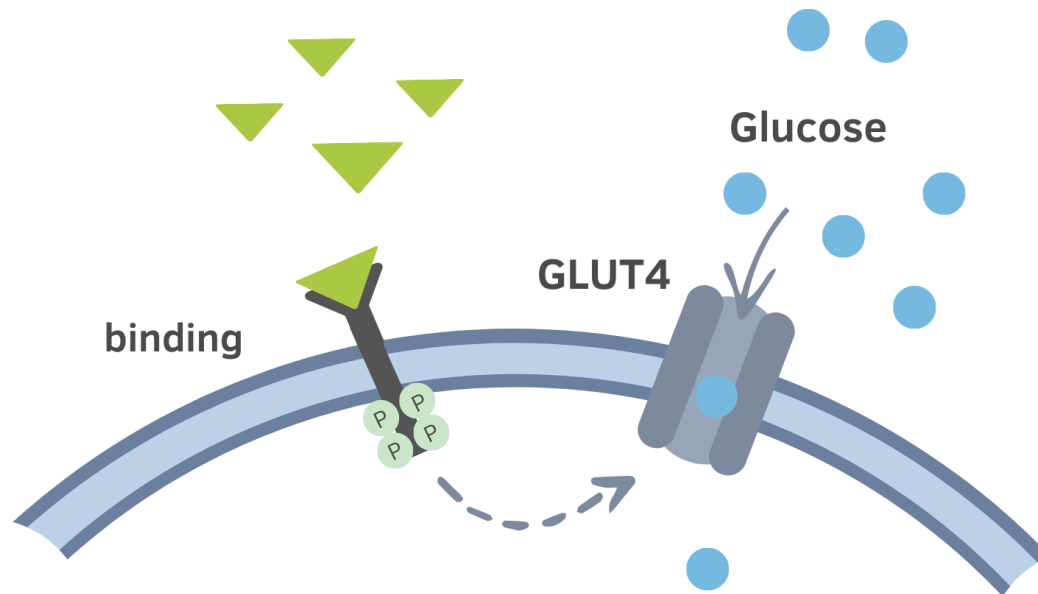
Graduate School
for Cellular and
Biomedical Sciences



Intact insulin structure
enables receptor binding
and glucose regulation

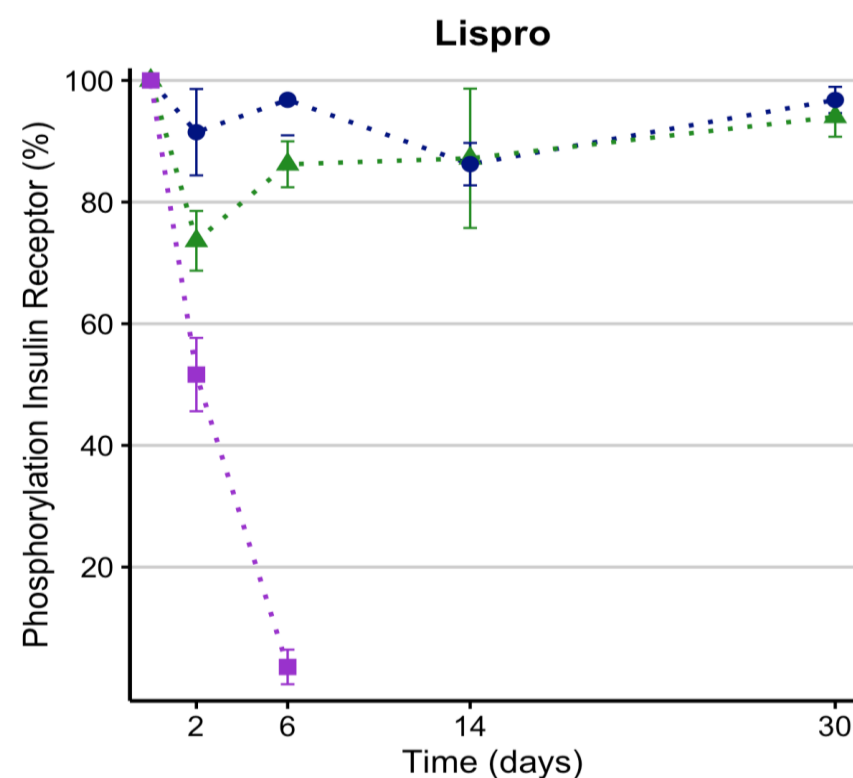
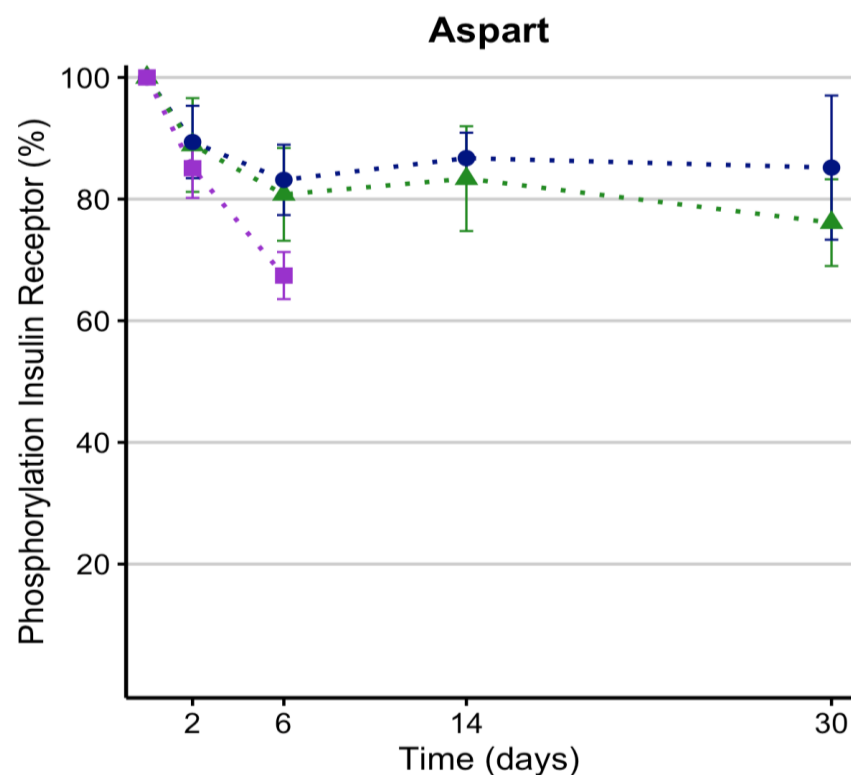
Impact factors:
Temperature, Shear Forces
Oxidation, pH, Light

Insulin's structure is
disrupted



The Biological Activity of Insulin

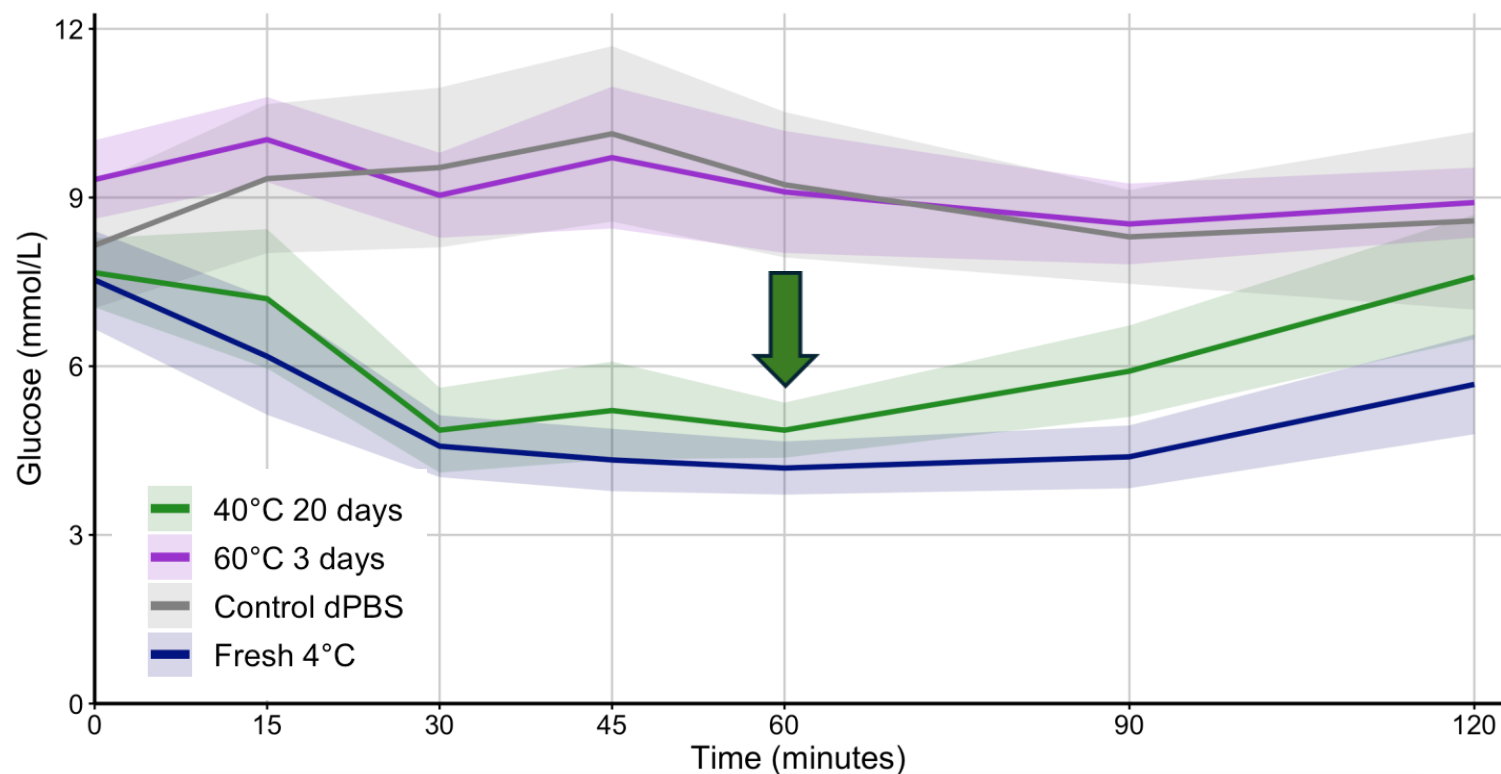
First In Cell Western (ICW) to determine the biological activity of thermally stressed insulin drug products. Above recommended storage temperature, activity decreases.



- 4°C (39°F)
- ▲ 40°C (104°F)
- 60°C (140°F)

Insulin Tolerance Test (ITT) Insulin Aspart in Mice

Blood glucose (BG) levels over time show that thermally stressed insulin aspart cannot lower BG to the same extent as standard insulin, and glucose recovery is faster.



Outlook & Next Steps

- Glucose uptake assays as 2nd functional read out to complement ICW data
- Additional ITT to deepen understand of stressed insulin on glucose metabolism
- OGTT in T1D humans