KAYA KEUTLER

ABOUT ME

Creative thinker and problem solver. Naturally enthusiastic and eager to learn. Flexible and innovative with somewhat good time management skills.

CONTACT

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EDUCATION

EBERHARD-KARLS UNIVERSITY OF TUEBINGEN, GERMANY
Bachelor of Science
2015

ALBERT-LUDWIGS UNIVERSITY OF FREIBURG, GERMANY
Master of Science
2018

OBJECTIVE

As a T1D patient every day is a self-experiment. Diabetes is the reason I got interested in biochemistry and it is the motivator keeping me on track. I experience both sides: patient and scientist, and see the gap of information between them. My goal is to close this gap through transparent research and science communication.

EXPERIENCE

BACHELOR THESIS

April 2015 – September 2015

As a bachelor student in Prof. Dr. García-Sáez's lab at the Eberhard-Karls University of Tuebingen, I purified and studied pro- and anti-apoptotic proteins. For this, I performed protein purification of the truncated version of Bcl-2 and then performed functionality screenings in suitable *in vitro* membrane systems modelling the outer mitochondrial membrane. Pore-formation or prevention of it, was followed by confocal microscopy. Prof. Dr. García-Sáez is currently investigating the interaction of pro- and anti-apoptotic proteins and differences caused by those proteins being membrane embedded vs. soluble.

EUROPEAN MOLECULAR BIOLOGY LAB (EMBL) INTERNSHIP

October 2016 – March 2017

During my internship in Dr. Schultz's lab at EMBL, Heidelberg, I established protocols for the stimulation of β-cells and assays for their secretory capacity. These methods were used to study the importance of autocrine signaling among β-cells in order to successfully release insulin. Additionally, I studied a novel class of β-cell signaling factors, so-called trace amines (TAs). TAs activate the G-protein coupled receptor (GPCRs) TAAR1, expressed by β-cells with unknown function so far. In my studies we identified TAs as activators of β-cell TAAR1 and potentiators of insulin secretion in the presence of glucose. Finally, I contributed to a study investigating free fatty acids as regulators of insulin secretion in β-cells, which got published in *Diabetes* 2018 (10.2337/db17-1215).

MASTER THESIS

May 2017 – March 2018

As a master student Dr. Schultz's lab, I focused on further investigating the role of TAs in regulating insulin secretion. For this, I

investigated several extraction protocols followed by mass spectrometry in order to detect TAs in β-cells as well as to quantify the released levels. Additionally, I manipulated the metabolic pathways necessary for TA synthesis and degradation. Using mass spectrometry, I was able to show TA synthesis from isotopically labeled precursor amino acids and their correlation with insulin secretion in β-cells. These studies revealed that β-cells possess the required enzymatic machinery for the synthesis of TAs. Additionally, we showed that potency of TAs in potentiating insulin release greatly depends on structure. The structural motif of an amino group separated from an aromatic group by two atoms (as found in most TA derivatives) was found most stimulatory. Finally, I provided some evidence for vesicular storage of TAs within β-cells. As part of my graduate research, I am following up on these outcomes further testing the importance of TA signaling for insulin secretion from β-cells.

GRADUATE RESEARCH

April 2018 – present

My current research builds on the findings of my master thesis but has greatly developed since. During my first and second year I focused on the establishment of *in vivo* work, manipulating glucose metabolism in wild-type (WT) and TAAR1-knock out mice. Over the last year and into the present I focused on cell-to-cell communication within the pancreatic islet (as reviewed in 10.1016/j.chembiol.2020.07.023) and in particular on the role of glucagon as an important factor for β-cell functionality. For this, I study pancreatic cell lines in co-culture manipulating culture conditions or work on primary mouse and human pancreatic islets.

SKILLS

- Small molecule mass spectrometry
- Live- & fixed-cell microscopy
- Handling of primary tissue
- Cell culture & hormone secretion assays
- Flow cytometry analysis