**A novel method for treating Psychiatric Disorders:**

**A Method for Inhibiting Importin to Treat Psychiatric Stress and Other Disorders**

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| **Project Number:** | 1875 |
| **Principal Investigator:** | Prof. Michael Fainzilber |
| **Patent Status:** | Pending |

**Overview**

**A method for increasing survival and expansion of hematopoietic stem cells by modulating the activity of two HSC proteins.**

**Background and Unmet Need**

Anxiety and stress-related disorders effect 10-30% of the general population and are therefore considered a major burden on public health. Current medical treatments for anxiety disorders include drugs that target various synaptic mechanisms, such as uptake of neurotransmitters. However, **severe side-effects and suboptimal efficacy prevent long-term treatment with such drugs**.

**The Innovation**

The research team led by Prof. Fainzilber characterized a specific importin family member, importin α5, which is a protein that plays a role in transferring proteins to the cells’ nucleus. They discovered that importin α5 influences anxiety levels, and therefore its manipulation can reduce anxiety and provide possible treatment for related psychiatric disorders. Moreover, they have identified approved drugs and nutraceuticals acting via importin α5 controlled pathways that can now be repurposed for treatment of anxiety disorders.

**The Technical Essence:**

Prof. Fainzilber's team used in vivo mouse models and a panel of behavioral tests to link between expression of importin α5 and anxiety levels. By deciphering signaling pathways regulated by importin α5 they were able to show both a molecular and pharmacological evidence for its involvement in anxiety. They have also identified approved drugs and nutraceuticals targeting this pathway that can be repositioned for anxiety treatment. Consequently importin α5 represents a potential novel drug target for the treatment of psychiatric disorders and may also impact multiple sclerosis. Additional details with regard to this technology can be obtained based on a non-disclosure agreement (NDA).

**Applications and Advantages:**

* **Reduce anxiety levels.**
* **Treat a variety of diseases** - from psychiatric disorders to multiple sclerosis.
* **Novel signaling pathway** - role in various neurological disorders.

**Development Status**

Prof. Shachar and her team have shown *in vitro* that mice hematopoietic stem and progenitor cells (HSPC) proliferate and differentiate better when CD74 is suppressed compared to *WT* cells. Accordingly, a similar affect was observed in MIF negative mice. *In vivo*, the team has shown, in mice models, that CD74 negative HSPCs demonstrate enhanced long-term self-renewal capacity compared to *WT* HSPCs.

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