Date: 2026-09-01
Reg. No. GU 2026/3216

THE SAHLGRENSKA ACADEMY
INSTITUE OF NEUROSCIENCE AND PHYSIOLOGY

Department of Pharmacology
Administrator: Amanda Martins
Telephone No: 031-786 3503
E-mail address: amanda.martins@gu.se

Announcement - scholarship at undergraduate/advanced level

The Department of Pharmacology, Institute of Neuroscience and Physiology, hereby announces a vacant scholarship at undergraduate/advanced level in Addiction medicine.

Training plan
Subject:
Investigations of the effect of tirzepatide on opioid-related responses in male and female rodents

Background:
The development of a multifaceted disease like opioid use disorder is influenced by psychological, social, biological, and genetic factors, and is associated with increased risks of mortality and morbidity, highlighting the need for effective treatments. Despite the availability of several treatment options, these medications yield modest treatment efficacy. There is thus a substantial need for new therapies, and recent advances have suggested peptides of the gut-brain axis as potential alternatives[1].

One key component of the gut-brain axis is glucagon-like peptide-1 (GLP-1), a hormone that influences both glucose and metabolic homeostasis[4]. Besides these well-known effects, our preclinical studies have demonstrated that GLP-1 receptor agonists reduce opioid taking, potentially by suppressing the rewarding properties of opioid (Fig 1)[1]. It should, however be noted that combining pharmaceuticals may be more beneficial for the treatment of heterogeneous conditions, such as opioid dependence, possibly as they address the multifaceted nature of this disease[5]. While the combination of gut-brain peptides has been shown to reduce body weight in obese rats, its effectiveness for treating opioid dependence remains unclear.

Fig 1. Summary of studies on GLP-1 and addictive drugs [1].

Tirzepatide, a new medication that combines GLP-1 receptor agonism with glucose-dependent insulinotropic polypeptide (GIP) activity[6], could therefore be considered an interesting candidate for treating AUD. Tirzepatide was initially found to control blood glucose levels and was thus approved for type 2 diabetes[6]. It was later demonstrated to reduce food intake, lower the consumption of palatable

foods, and decrease body weight, leading to its approval for obesity[6]. Tirzepatide has demonstrated superiority over GLP-1R agonists, as it has a more profound efficacy in controlling blood glucose levels and lowering body weight[7]. The impact of tirzepatide on opioid-related responses and the downstream mechanisms responsible for its effects are unknown, and this preclinical project aims to address these knowledge gaps.

Purpose:
The specific aim of the present project is to explore the impact of tirzepatide on opioid-induced behaviors in rodents.

Method:
Current treatments for opioid dependence include opioid replacement therapy, bupropion, and methadone, which improve cessation success rates by alleviating withdrawal symptoms and craving. However, relapse rates remain high, and we hypothesize that tirzepatide could attenuate different aspects of opioid use and dependence and constitute a treatment alternative. Opioid dependence develops after long-term use of high amounts of opioids, where the motivation to obtain opioids is essential for seeking the drug and thus for the development of opioid dependence.

We will test the effect of different doses of tirzepatide (acute or repeated injections) on opioid intake and the motivation to obtain opioid (FR5, breakpoint, and progressive ratio) in male and female rats in the operant self-administration model. After prolonged intake, environmental cues or stressors can trigger intense craving and drug-seeking behavior. Such relapse-like behaviors can be modeled preclinically using two well-established paradigms. Following the extinction of opioid-seeking behavior in the self-administration model, reinstatement can be triggered by opioid -associated cues, stress, or a priming dose, serving as a proxy for relapse. The conditioned place preference reinstatement models the re-emergence of opioid preference after extinction, typically reactivated by drug priming or contextual cues, a behavior that also reflects relapse. Together, these models are critical tools for studying opioid craving and relapse. We will therefore assess the ability of tirzepatide, at different doses, to suppress relapse-like behaviors in these two models, where the latter is supported by preliminary data.

We will then conduct a series of tests to determine whether tirzepatide can prevent the rewarding effects of opioid, as reward is a key driver of escalated opioid intake and poses a risk of developing opioid dependence later in life. Therefore, we will test if tirzepatide attenuates the ability of opioids to cause a locomotor stimulation, a crude measurement of dopamine release in NAc. To further investigate the connection to reward, we will examine the impact of tirzepatide on dopamine release using both microdialysis and fiber photometry and on the ability of opioid to condition a place preference. On a similar note, we will test the hypothesis that tirzepatide blocks the ability of opioid to cause a locomotor sensitization, a finding supported by our preliminary data.

Work plan/schedule:

Month 1: Training with supervisor, introduction to the lab, facilities, animals and equipment.; Month 2-11: Running experiments and analyzing data, planning experiments as well as scientific discussion with the research team; Month 12: Summary of data, writing article, presenting results to the group and reflecting upon the learning outcomes

Learning outcome:
The student will learn the basics in addiction research and will be familiarized with preclinical addiction methods. The student will through seminars and presentation of obtained results learn more about the addiction theories. The student will be trained in laboratory work and working as a researcher. The scholarship covers living expenses and is not covered for work conducted at the University of Gothenburg.

Period
2026-10-01 to 2027-09-30

Financing
4 payments of 39 000 SEK. A total of 156 000 SEK for the whole period.

If you require any further information, please contact Elisabet Jerlhag Holm, elisabet.jerlhag@pharm.gu.se, supervisor.

Application
To apply please fill out the form “Scholarship application” and send it to Elisabet Jerlhag Holm, elisabet.jerlhag@pharm.gu.se, supervisor.

Please attach a copy of:

CV
Letter of motivation
Registration certificate

The closing date is 2026-09-25