

Press release

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Basic information

Name: Shokouh Arjmand Email: shokouh@clin.au.dk Phone: +4550313719

Department of: Clinical Medicine

Main supervisor: Gregers Wegener

Title of dissertation: "The Interplay Between the Estrogen Ensemble and Antidepressants: A Search for Therapeutic Insights"

Date for defence: 23/05/2024 at (time of day): 14:00 Place: Konference G206-122, indg. G, G206, Aarhus University Hospital

Press release (Danish)

"Samsillet mellem østrogen signalering og antidepressiva"

Ændringer i hormonniveauer påvirker humøret, som det ofte ses ved tilstande som præmenstruelt dysforisk syndrom, perinatal depression, fødselsdepression og præmenopausal depression. Sammenholdt med observationen, at størstedelen af depressive lidelser rammer kvinder, undersøgte vi om antidepressiva kan påvirke de biologiske elementer af signalering gennem kønshormonreceptorer, især østrogenreceptor alfa (ER α).

Vi undersøgte hypotesen om, at antidepressiva ændrer aktiviteten af ER α .

Vi anvendte molekyllære og simulerings værktøjer for at påvise, at ER α kan formidle virkningen af antidepressiva. Vi undersøgte yderligere muligheden for interaktion af antidepressiva med membran-ER α og studerede virkningen af essentielle proteiner i responsen fremkaldt af behandling med antidepressiva. I et forsøg på at undersøge, om østrogen kan påvirke de antidepressive lignende adfærdseffekter udløst af S-ketamin i en selektivt avlet genetisk dyremodel af depression, undersøgte vi, om sådanne effekter kunne være kønsspecifikke, og om de varierede over østruscyklussen hos hunrotter.

Dette ph.d.-projekt fandt en rolle af ER α i humørregulering, og identificerer ER α som et sandsynligt terapeutisk mål for udvikling af nye lægemidler. Desuden rejses muligheden for, at antidepressiva delvist kan påvirke kønshormonreceptorer.

På trods af at yderligere undersøgelser er nødvendige, foreslås målrettet targetering mod kønshormonreceptorer som udviklingstarget af nye antidepressive behandlinger.

Et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Shokouh Arjmand, der forsvare det d. 23. maj 2024.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 23. maj 2024 kl. 14 i Konference G206-122, indg. G, G206, Aarhus Universitetshospital, Palle Juul-Jensens Blvd. 99, 8200, Aarhus N.

Titlen på projektet er "The Interplay Between the Estrogen Ensemble and Antidepressants: A Search for Therapeutic Insights".

Yderligere oplysninger: Ph.d.-studerende Shokouh Arjmand, e-mail: shokouh@clin.au.dk, tlf. +4550313719.

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Heather Brenhouse, Professor, Department of Psychology, Northeastern University, Boston MA, USA

Press release (English)

"The Interplay Between the Estrogen Ensemble and Antidepressants: A Search for Therapeutic Insights"

Given the premise that changes in hormone levels impact mood, as evidenced in conditions such as premenstrual dysphoric disorder, perinatal depression, postpartum depression, and premenopausal depression, alongside the consistent observation that major depressive disorder disproportionately affects women, with a lifetime prevalence twice as high as that in men, drove us to investigate whether antidepressants might engage with the biological elements of sex steroid receptors, particularly estrogen receptor alpha (ER α), to produce their therapeutic effects.

We scrutinized the hypothesis that antidepressants may alter the activity of ER α . Utilizing various molecular and computational tools, we demonstrated that ER α may mediate the effect of antidepressants. Furthermore, we assessed the possibility of the interaction of antidepressants with membrane ER α and studied the impact of essential heat-shock proteins in the response evoked by treatment with antidepressants.

In an attempt to explore whether estrogen can influence the antidepressant-like behavioral effects of S-ketamine in a selectively-bred genetic animal model of depression, we examined whether such effects could be sex-specific and whether they varied across the estrous cycle in female rats exhibiting depressive-like behaviors and their control counterparts.

This PhD project emphasizes the role of ER α in mood regulation, identifies ER α as a plausible therapeutic target, and raises the possibility that the mechanism of action of antidepressants may, in part, converge on sex steroid receptors. While further studies are warranted, targeting sex steroid receptors could hold promise for the development of novel antidepressant treatments.

The project was carried out by Shokouh Arjmand, who is defending her dissertation on the 23rd of May 2024.

The defence is public and takes place on the 23rd of May at 14:00 in Conference room G206-122, Entrance G, G206, Aarhus University Hospital, Palle Juul-Jensens Blvd. 99, 8200, Aarhus N. The title of the project is "The Interplay Between the Estrogen Ensemble and Antidepressants: A Search for Therapeutic Insights".

For more information, please contact PhD student Shokouh Arjmand, email: shokouh@clin.au.dk, Phone +45 50313719.

Assessment committee:

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