

# Acute serotonergic modulation of brain regions and behaviors implicated in mood regulation

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| <b>Submission date</b><br>05/12/2019   | <b>Recruitment status</b><br>No longer recruiting             | <input type="checkbox"/> Prospectively registered    |
|  |   | <input type="checkbox"/> Protocol                    |
| <b>Registration date</b><br>10/03/2020 | <b>Overall study status</b><br>Completed                      | <input type="checkbox"/> Statistical analysis plan   |
|  |   | <input checked="" type="checkbox"/> Results          |
| <b>Last Edited</b><br>10/03/2020       | <b>Condition category</b><br>Mental and Behavioural Disorders | <input type="checkbox"/> Individual participant data |

## Plain English summary of protocol

### Background and study aims

Selective serotonin reuptake inhibitors (SSRIs) are considered first-line treatment in depression. However, the exact mechanism of this drug is still not fully understood today. The aim of this study is to investigate the effect of a single oral dose of SSRIs on brain and behavior and compare it to placebo (dummy drug) in healthy volunteers.

### Who can participate?

Female and male healthy volunteers between 20 and 30 years of age

### What does the study involve?

All participants receive a single oral dose of the SSRI escitalopram and placebo. One group receives escitalopram first and then undergoes a magnetic resonance imaging (MRI) scan 3-4 hours later. After a wash-out period of 8 weeks, this group of participants receives a placebo pill and then again undergoes MRI. A second group starts with the placebo pill and then, after 8 weeks, receives escitalopram. Neither the participants nor the experimenter will know if the participants receive the escitalopram or the placebo pill. Only after the study has finished will the experimenter learn the treatment orders. Before each MRI scan session, participants fill out questionnaires assessing depression and mood.

### What are the possible benefits and risks of participating?

Participants receive financial compensation for taking part in the study. A single oral dose of SSRI rarely has minimal temporary side effects, such as nausea, changes in sleep, less sexual arousal, restlessness, or headaches. MRI scanning does not have harmful effects, only rarely may participants experience circulatory problems.

### Where is the study run from?

Max Planck Institute for Human Cognitive and Brain Sciences (Germany)

### When is the study starting and how long is it expected to run for?

October 2011 to April 2013

Who is funding the study?  
Max Planck Institute for Human Cognitive and Brain Sciences (Germany)

Who is the main contact?  
Dr Julia Sacher  
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## Contact information

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Scientific

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## Additional identifiers

**Clinical Trials Information System (CTIS)**  
2019-003470-12

**ClinicalTrials.gov (NCT)**  
Nil known

**Protocol serial number**  
NRO-080

# Study information

## Scientific Title

Acute serotonergic modulation of intrinsic functional connectivity and function in brain regions and behaviors implicated in mood regulation - a pharmacological fMRI study in healthy volunteers

## Acronym

SEROTONIN

## Study objectives

Hypothesis 1: It is hypothesized that an acute serotonergic challenge has a large-scale impact on the intrinsic functional connectivity of most cortical and subcortical areas and is not limited to specific networks.

Hypothesis 2: It is hypothesized that an acute serotonergic challenge alters BOLD response in main areas of the reward system and explore, whether these early alterations affect only responses to punishment or responses to both reward and punishment.

Hypothesis 3: It is hypothesized that an acute serotonergic challenge alters BOLD response in amygdala and explore, whether this affects cognitive performance and emotional distraction.

## Ethics approval required

Old ethics approval format

## Ethics approval(s)

Approved 11/10/2010, Ethikkommission an der Medizinischen Fakultät der Universität Leipzig (ethics board of the Medical Faculty of the University of Leipzig, Käthe-Kollwitz-Straße 82, 04109 Leipzig, Germany; Tel: +49 (0)341/97 154 90; Email: [ethik@medizin.uni-leipzig.de](mailto:ethik@medizin.uni-leipzig.de)), ref: 246-2009-09112009

## Study design

Single-centre double-blind placebo-controlled crossover study

## Primary study design

Interventional

## Study type(s)

Other

## Health condition(s) or problem(s) studied

Effects of the antidepressant escitalopram in healthy volunteers

## Interventions

The researchers administer a single oral dose of 20 mg escitalopram, a selective serotonin reuptake inhibitor (SSRI), or placebo to healthy participants in a double-blind, placebo-controlled, crossover design. Two treatment orders are randomly assigned to participants to ensure complete balancing of treatments. Escitalopram or placebo are administered at two different test days separated by a wash-out period of 8 weeks. At the first test day, participants undergo a baseline MRI scan before initial drug administration. For the drug MRI scans, the

researchers measure participants 3-4 hours after drug administration, during peak concentration of escitalopram in blood. Scanning time is approx. 60 minutes per scan, consisting of structural MRI, resting state fMRI, and functional MRI (cognitive load task and reward task). Before each scan session, participants fill out questionnaires assessing depression (Hamilton Rating Scale for Depression) and mood (Profile of Mood states, and MOODS spectrum self-report).

### **Intervention Type**

Drug

### **Phase**

Not Applicable

### **Drug/device/biological/vaccine name(s)**

Escitalopram

### **Primary outcome(s)**

Structural, functional, and resting-state MRI data measured during baseline, placebo, and drug sessions

### **Key secondary outcome(s)**

1. Reward and punishment processing measured using a monetary reward task, which participants perform during the functional MRI scans at baseline, placebo, and drug sessions
2. Cognitive performance measured using a cognitive load task, which participants perform during the functional MRI scans at baseline, placebo, and drug sessions

### **Completion date**

31/12/2018

## **Eligibility**

### **Key inclusion criteria**

1. 20-30 years of age
2. Naive to antidepressants

### **Participant type(s)**

Healthy volunteer

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Sex**

All

### **Total final enrolment**

24

### **Key exclusion criteria**

1. Current or past psychiatric diagnosis as assessed with SKID-I and SKID-II interview
2. Major head trauma or neurological disease, current or in history
3. Use of psychotropic medication or of recreational drugs
4. MRI contraindications such as metal implants, claustrophobia, pregnancy
5. Smoking
6. Irregular sleep/wake rhythm (e.g., regular nightshifts or cross timeline travel)

**Date of first enrolment**

01/11/2011

**Date of final enrolment**

30/04/2013

## Locations

**Countries of recruitment**

Germany

**Study participating centre**

**Max Planck Institute for Human Cognitive and Brain Sciences**

Stephanstrasse 1A

Leipzig

Germany

04103

## Sponsor information

**Organisation**

Max Planck Institute for Human Cognitive and Brain Sciences

## Funder(s)

**Funder type**

Research organisation

**Funder Name**

Max-Planck-Institut für Kognitions- und Neurowissenschaften

**Alternative Name(s)**

Max Planck Institute for Human Cognitive and Brain Sciences, MPI for Human Cognitive and Brain Sciences

## Funding Body Type

Private sector organisation

## Funding Body Subtype

Other non-profit organizations

## Location

Germany

# Results and Publications

## Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study will be stored in a repository

Type of data: Statistic maps of functional connectivity analysis

Repository name: Neurovault.org

Weblink: <https://identifiers.org/neurovault.collection:190>

Process for requesting access: freely available

Consent from participants: Participants gave their consent that the results of this study will be published for scientific purposes.

Data anonymization: pseudonymised

## IPD sharing plan summary

Stored in repository

## Study outputs

| Output type                     | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---------------------------------|---------|--------------|------------|----------------|-----------------|
| <a href="#">Results article</a> | results | 06/10/2014   | 16/12/2019 | Yes            | No              |