



**Project Leader Kazutaka Ikeda Addictive Substance Project**

**Addictive Drugs are Double-edged Swords: They can become both harmful and beneficial depending on how they used**

Addiction to substances (e.g. drugs, alcohol, tobacco) and behavior (e.g. internet, gambling) is a serious public health problem. Moreover, use of legal drugs has been increasing in Japan in recent years. It is important to prevent and solve problems of addictions.

On the other hand, some addictive drugs are also widely used as analgesics and treatment of developmental disorders. Thus, it is considered that some molecules involved in action of addictive drugs are commonly related to analgesics and developmental disorders.



The goals of our project are as follows: 1) Development of novel treatment and prevention of addiction. 2) Improvement of personalized pain treatment. 3) Development of novel treatment against developmental disorders.

**“We are trying to improve treatment, prevention, and understanding of addiction, pain, and developmental disorders by revealing the mechanisms underlying addiction.”**

All goals can make significant contribution to the society. We aim to those goals through studying the action mechanisms of addictive drugs using molecular biological approach, behavioral pharmacological approach, human genome analysis, and clinical approach.

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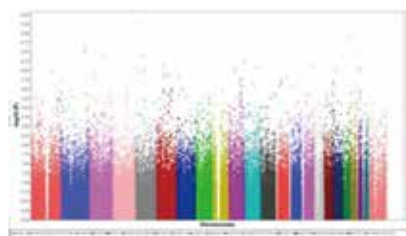
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**Addictive Substance**

Topics of our research

**Addiction research**

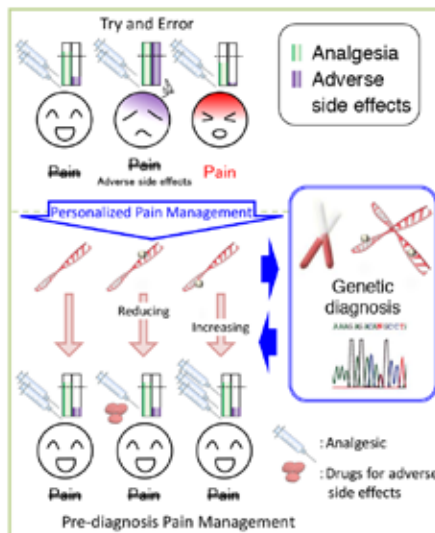


We study action mechanisms of opioids, dopamine, and hallucinogens such as phencyclidine to reveal the onset of addiction using several mouse models and behavioral pharmacological study. In parallel with the basic research, we also develop and verify a scale to addiction severity.



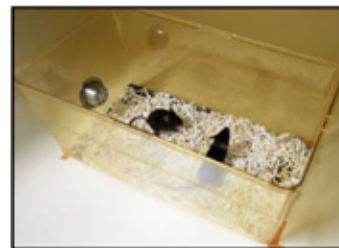
**Pain treatment research**

Sensitivity of opioid analgesics is associated with polymorphisms of several genes. Based on the genome information, we develop personalized pain treatment.



**Developmental disorder research**

We focus on autism and attention deficit hyperactivity disorder (ADHD). In our project, tuberous sclerosis complex 1 and 2 hetero knockout mouse and dopamine transporter knockout mouse are mainly used as models of autism and ADHD, respectively. We are finding novel treatments for autism.



**Members**

- Kazutaka Ikeda
- Shinya Kasai
- Daisuke Nishizawa
- Soichiro Ide
- Seii Ohka
- Masayo Fujita
- Hiroko Kotajima

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