







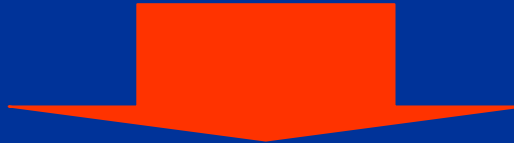
**Integrated *in vivo* Safety Pharmacology Study  
Developed for Investigating Effects of a Drug  
on the Central Nervous, Cardiovascular, and  
Respiratory Systems Simultaneously in Dogs,  
Monkeys, or Other Animals**

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# Current *in vivo* Safety Pharmacology Study

<b>Irwin or FOB</b>		
<b>Telemetry</b>		
<b>WBP</b>		



**Central Nervous, Cardiovascular, and Respiratory Systems should be examined separately.**

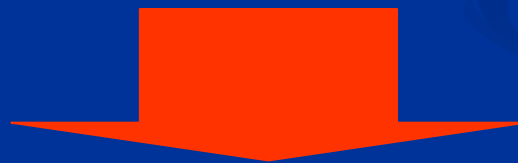
## **Disadvantages of Current *in vivo* Study**

- Impossible to conduct WBP using large animal under ideal environmental conditions
- Make it difficult to predict clinical side effects on CNS, CV and RES
- Impossible to evaluate effects on CNS, CV and RES simultaneously
- Less efficient due to separate tests
- Unfavorable from animal protection stand point of view



# Integration of *in vivo* Safety Pharmacology Study

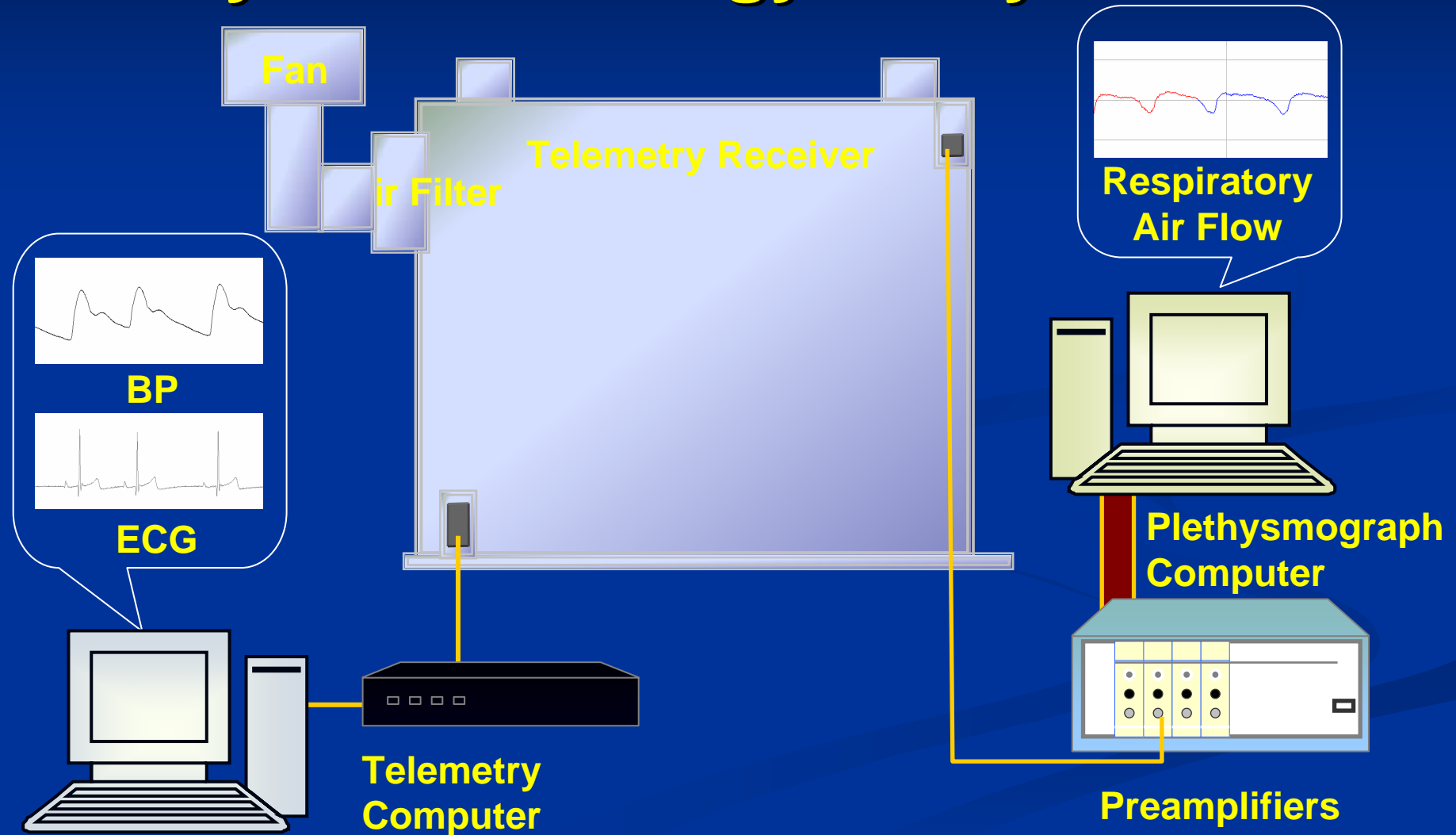
<b>Irwin or FOB</b>	
<b>Telemetry</b>	
<b>WBP</b>	



**CNS, CV, and RES can be  
examined simultaneously!**



# Integration of *in vivo* Safety Pharmacology Study



# External Appearance of Integrated *in vivo* System

DSTC  
Drug Safety Testing Center



# General Observation on the Central Nervous System

## For an Animal Staying in the Cage



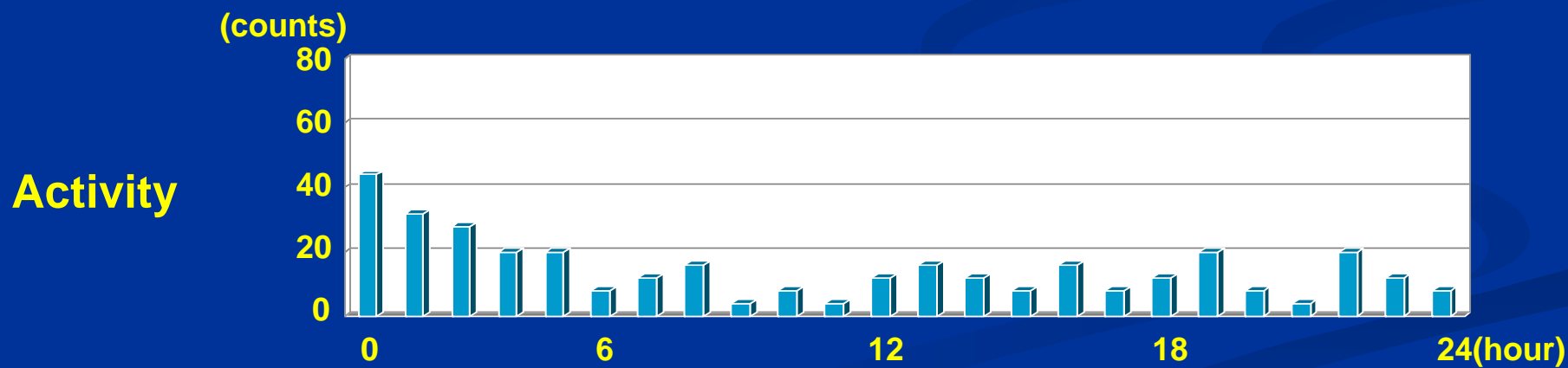
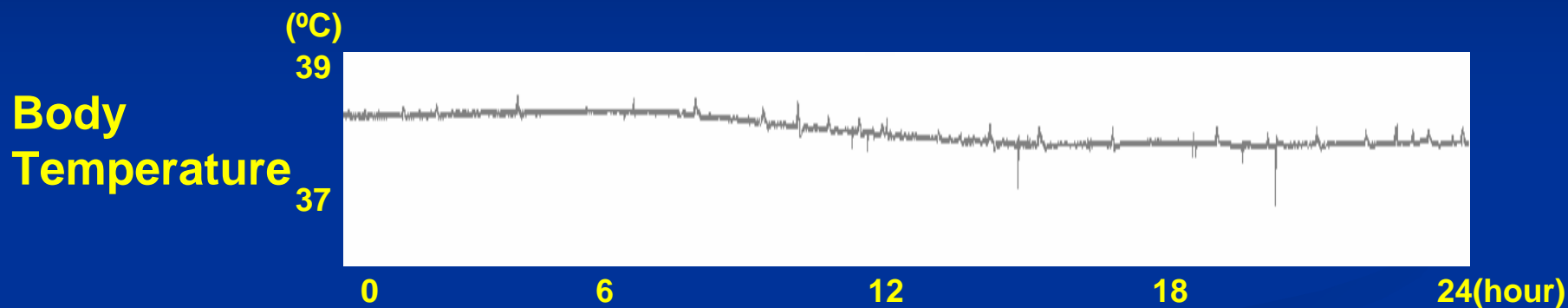
- Viability
- Posture
- Behavior
- Activity
- Central Excitation
- Convulsions

## For an Animal removed to Outside of the Cage



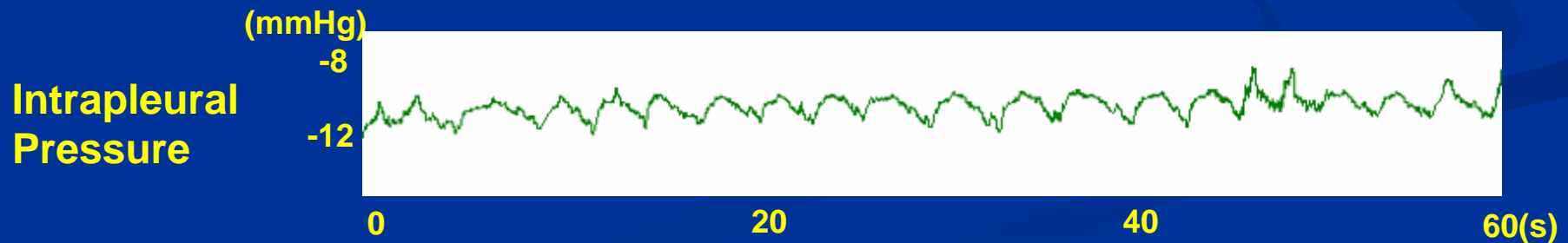
- Muscle Tonus
- Righting Reflex
- Pupillary Reflex
- Palpebra Reflex
- Pinna Reflex
- Hearing Test
- Haptic Test
- Algetic Test
- Oculus
- Nose
- Mucosa
- Salivate
- Vomiting/Feces and Urine

# Representative Data of Telemetry



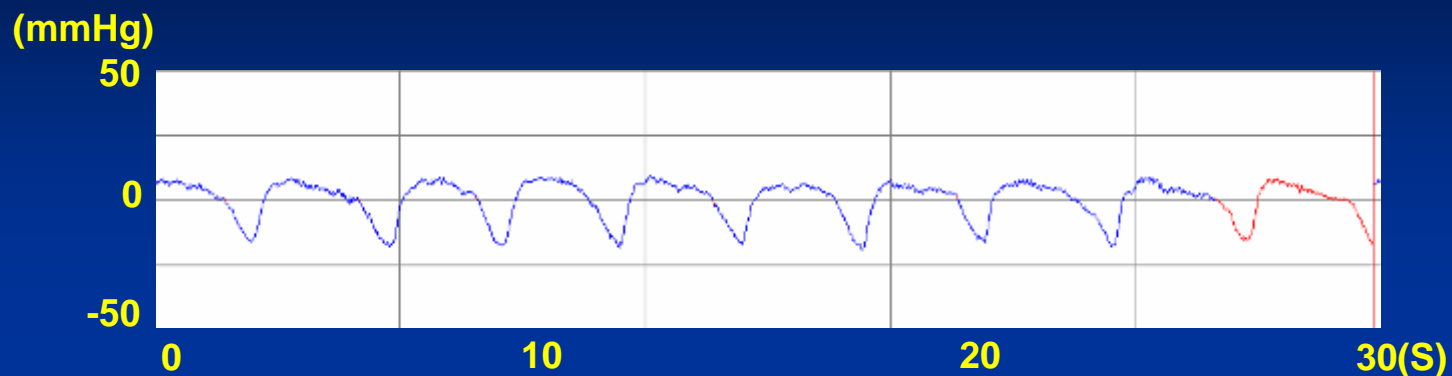


# Representative Data of Telemetry – Cont'd

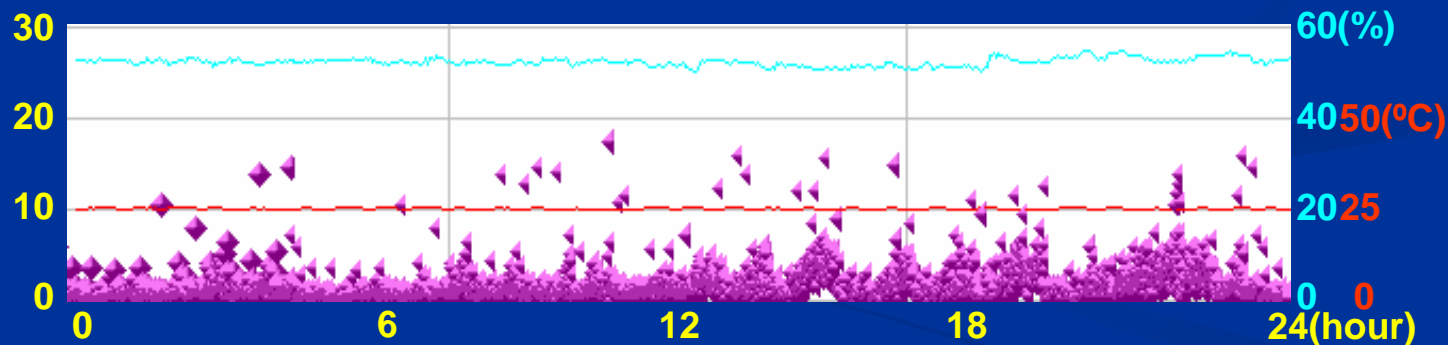


# Representative Data of WPB

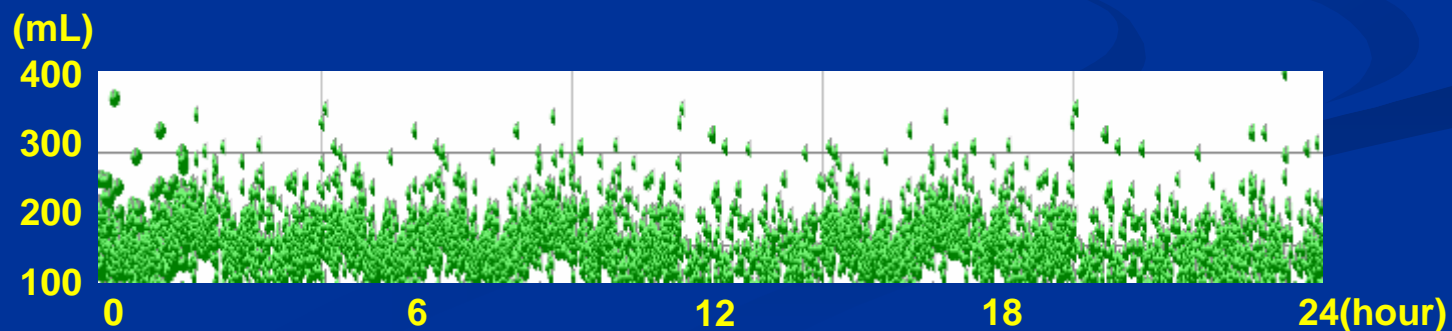
**Respiratory  
Air Flow**



**Penh,  
Room  
Temperature  
and Humidity**



**Tidal Volume**



# Summary

- **WBP is available under less stressful environmental conditions**
- **Improve predictability of clinical side effects on CNS, CV and RES**
- **Simultaneous evaluation of effects on CNS, CV and RES become possible**
- **Facilitate evaluation and result in enhancement of efficiency of experiments**
- **Contribute to animal protection by reducing number of animals to be tested**