

# imOmics & Zebra Fish

## 动态分离离子组学与斑马鱼研究

许越

2019. 1. 22

# NMT



‘非损伤微测技术’ 简称

是一种活体生理功能检测技术

	DNA测序仪	非损伤微测系统
检测对象	脱氧核糖核酸	离子分子流速
揭示现象	遗传信息	生理功能
组学	Genomics 基因组学	imOmics 动态分离离子组学



以离子分子流速为载体，研究活体生物  
与外界环境进行信息交换的过程。



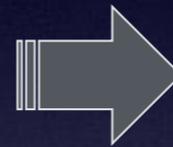
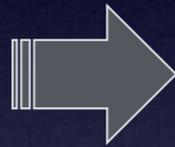
以离子分子流速为载体，研究活体生物与外界环境进行信息交换的过程。

$\text{Ca}^{2+}$	细胞凋亡（出） / 受精过程（进） ...
$\text{O}_2$	光合作用（出） / 能量代谢（进） ...
.....	.....

# 技术和学术突破



传统 NMT



imOmics<sup>®</sup>  
动态分离离子组学

# 学术和技术突破

## new Developments



n { 分子离子传感器种类  
及多分子同时检测

n = 1, 2, 3, 4, 5... n

传感器种类
H <sup>+</sup>
Ca <sup>2+</sup>
K <sup>+</sup>
Na <sup>+</sup>
Cl <sup>-</sup>
NH <sub>4</sub> <sup>+</sup> 、NO <sub>3</sub> <sup>-</sup>
Mg <sup>2+</sup>
Cd <sup>2+</sup>
O <sub>2</sub>
H <sub>2</sub> O <sub>2</sub>
IAA
Pb <sup>2+</sup> , Cu <sup>2+</sup>

# 学术和技术突破

## new Developments



人体乳腺肿瘤组织 $O_2/H^+$ 同时检测

[点击观看视频](#)

# 学术和技术突破

new Developments



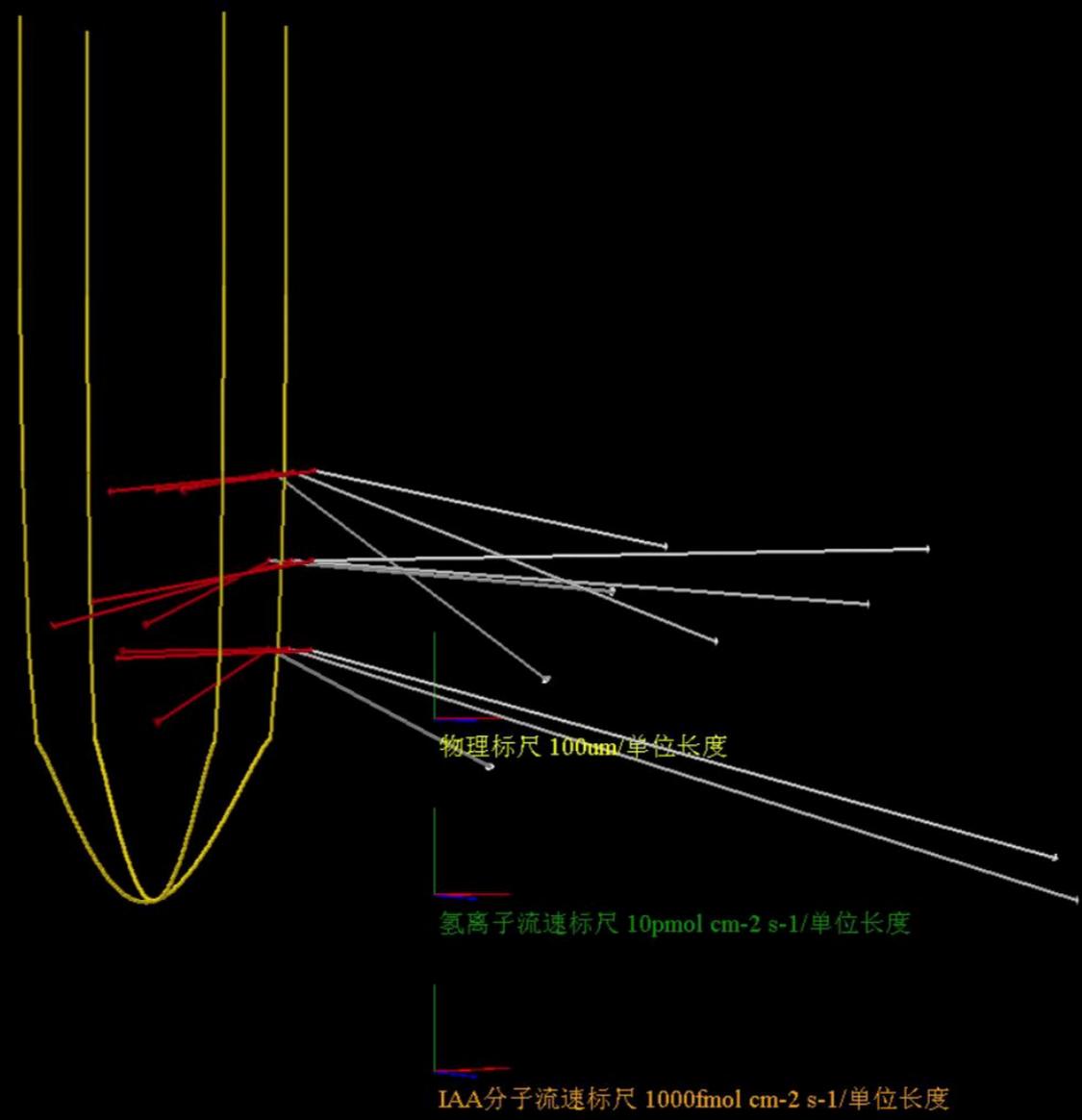
## 世界首个商业化IAA传感器



# 学术和技术突破

## new Developments

### 植物根 IAA/H<sup>+</sup>同时检测



# 学术和技术突破

## 大数据软件技术

**流速云**® IF100

The screenshot displays the 流速云 (FlowCloud) web interface. At the top, there are two text entries: "2019.1.7 明天全体人员一起开会, 讨论下一阶段的工作安排。....." and "#44 2019-01-07 14:49:33 创建者:赵 老师". Below these is a navigation bar with "相关文件" (Related Files), "搜索文件" (Search Files), and "上传文件" (Upload Files). The main content area shows a list of files with columns for ID, date, time, uploader, and original filename. Each file entry includes icons for download, share, and delete.

ID	Date	Time	上传者	原文件名
#109	2018-12-26	14:45:41	赵 老师	3.1.csv
#106	2018-12-26	13:28:19	赵 老师	3.1.csv
#100	2018-12-26	10:40:53	赵 老师	2.2.csv
#91	2018-12-20	10:31:57	赵 老师	2.1.csv
#88	2018-12-18	10:30:10	赵 老师	2.2.csv

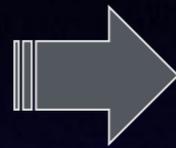
[点击观看流速云教程视频](#)

NMT: Science推荐产品

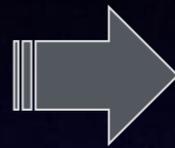
# 学术和技术突破

new Discovery

传统 NMT



nNMT



imOmics®  
动态分离离子组学

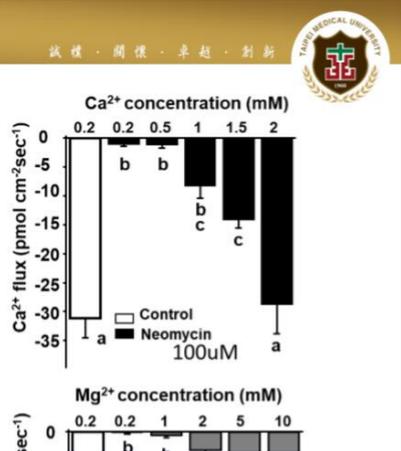
臺北醫學大學  
TAIPEI MEDICAL UNIVERSITY

誠樸 · 開懷 · 卓越 · 創新

**Addition of Ca<sup>2+</sup> neutralized the inhibition of neomycin**  
高鈣中和了新黴素對毛細胞機械性通道的抑制

MET channel

(Lin LY, et al. AJP 2013)



## 斑馬魚排氨細胞的發現

Ammonia excretion by the skin of zebrafish (*Danio rerio*) larvae

Tin-Han Shih,<sup>1</sup> Jun-Lin Horng,<sup>2</sup> Pung-Pung Hwang,<sup>2</sup> and Li-Yih Lin<sup>1</sup>

<sup>1</sup>Department of Life Science, National Taiwan Normal University, Taipei, Taiwan, Republic of China; and <sup>2</sup>Institute of Cellular and Organismic Biology, Academia Sinica, Taipei, Taiwan, Republic of China

Submitted 14 May 2008; accepted in final form 22 September 2008

Am J Physiol Cell Physiol 295: C1625–C1632, 2008. First published September 24, 2008; doi:10.1152/ajpcell.00255.2008.

推翻了膜片钳技术的错误结论

Contents lists available at SciVerse ScienceDirect

Biochemical Pharmacology

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journal homepage: www.elsevier.com/locate/biochempharm

Biochemical Pharmacology

Uncoupling of K<sup>+</sup> and Cl<sup>-</sup> transport across the cell membrane in the process of regulatory volume decrease

Linjie Yang<sup>a</sup>, Linyan Zhu<sup>a</sup>, Yue Xu<sup>b</sup>, Haifeng Zhang<sup>c</sup>, Lixin Chen<sup>a,\*</sup>, Liwei Wang<sup>c,\*</sup>

<sup>a</sup> Department of Pharmacology, Medical College, Jinan University, Guangzhou 510632, China  
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<sup>d</sup> College of Pharmacy, Jinan University, Guangzhou 510632, China  
<sup>e</sup> Guangdong Key Laboratory for Bioactive Drugs Research and, Guangdong Pharmaceutical

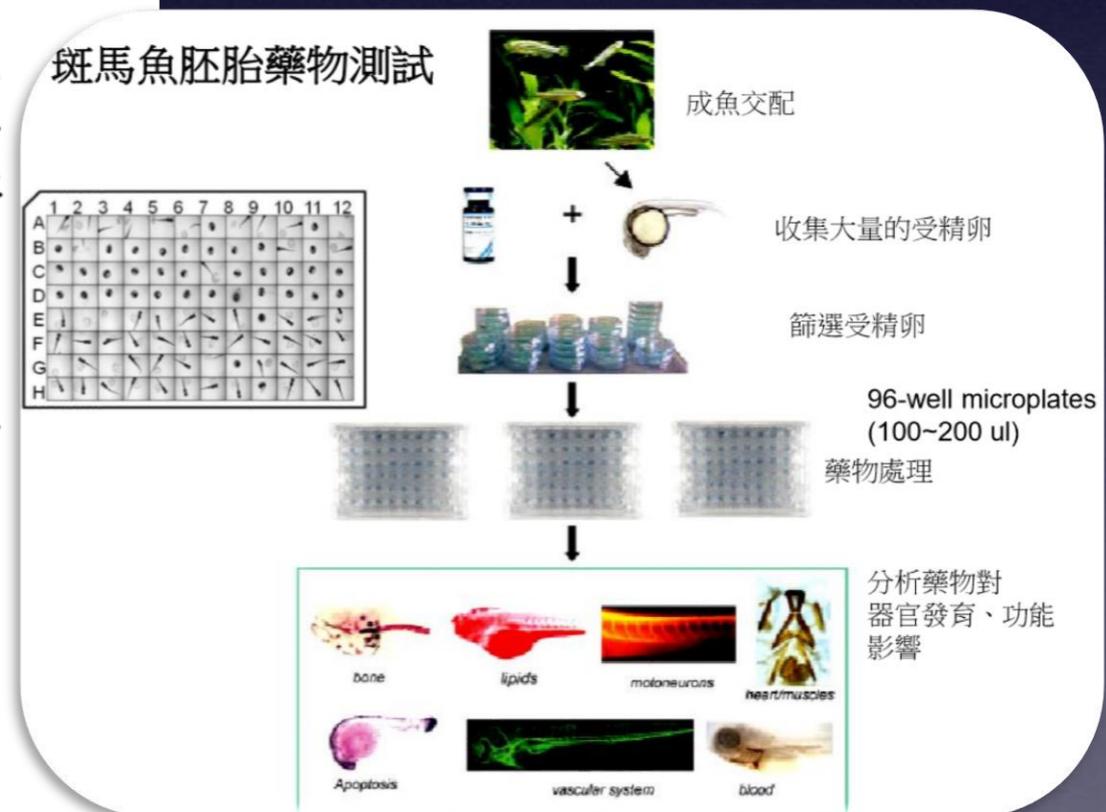


# imOmics & Zebra Fish

## 动态分离离子组学与斑马鱼研究

### 總結

1. 斑馬魚胚胎是很好研究生理、藥理、毒理的模式動物。
2. 非損傷微側系統能夠有效率且精確分析斑馬魚胚胎的生理功能，以及反映出藥物、毒物所產生的影響。
3. 非損傷微側系統在斑馬魚研究上的應用很大的仍有發展空間。



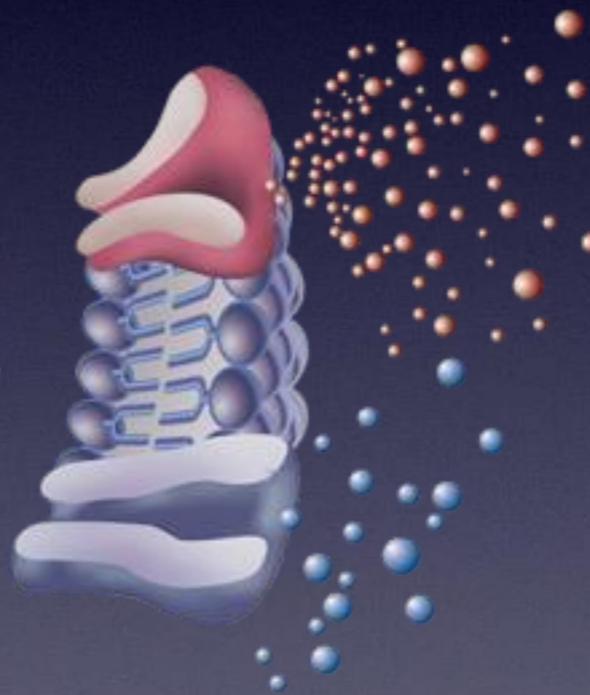
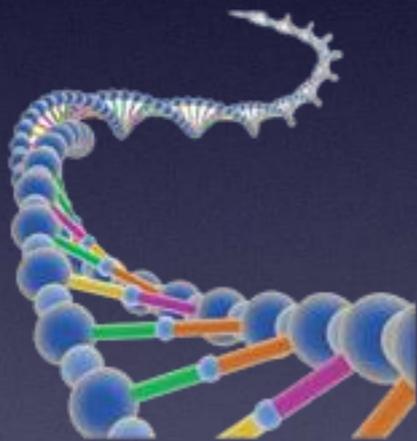
# 抢占未来生命科学制高点



genOmics

proteOmics

imOmics



# 技术突破是学术创新的基础

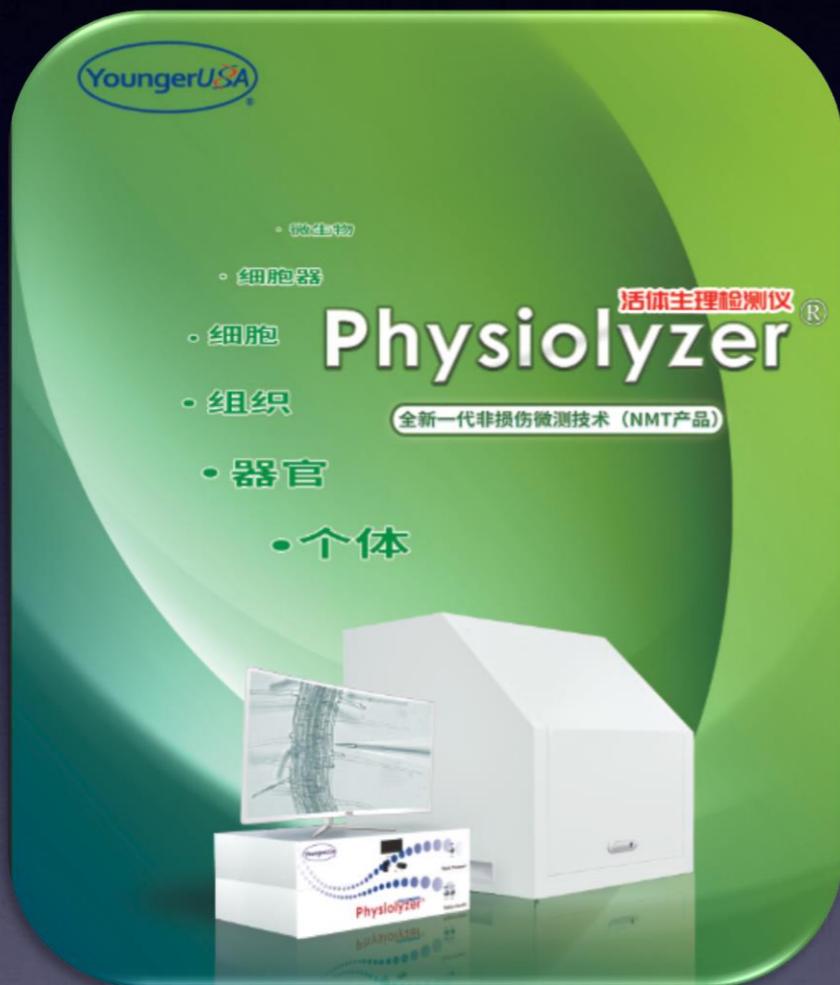


基因测序仪



人类基因组计划

# 技术突破是学术创新的基础



非损伤微测系统



斑马鱼计划?

# 资源与支持



- 院士专家顾问组
- 基金支持
- NMT应用专家及群体智慧
- 专业化/商业化服务



2019

Happy New Year



中关村旭月非损伤微测技术产业联盟<sup>®</sup>

Zhongguancun Xuyue Non-invasive Micro-test Technology Industrial Alliance



# 学术和技术突破

## new Developments

### Cancer Medicine

Open Access

ORIGINAL RESEARCH

## Recombinant horseradish peroxidase variants for targeted cancer treatment

Günther Bonifert<sup>1</sup>, Lisa Folkes<sup>2</sup>, Christoph Gmeiner<sup>1</sup>, Gabi Dachs<sup>3</sup> & Oliver Spadiut<sup>1</sup>

<sup>1</sup>Research Area Biochemical Engineering, Institute of Chemical Engineering, Vienna University of Technology, Vienna, Austria

<sup>2</sup>Department of Oncology Oxford Institute for Radiation Oncology, University of Oxford, Northwood, Middlesex, U.K.

<sup>3</sup>Mackenzie Cancer Research Group, Department of Pathology, University of Otago, Christchurch, New Zealand

#### Keywords

Antibody directed enzyme prodrug therapy (ADEPT), horseradish peroxidase, indole-3-acetic acid, MDA-MB-231 breast carcinoma, *Pichia pastoris*, T24 bladder carcinoma

#### Correspondence

Oliver Spadiut, Research Area Biochemical Engineering, Institute of Chemical

#### Abstract

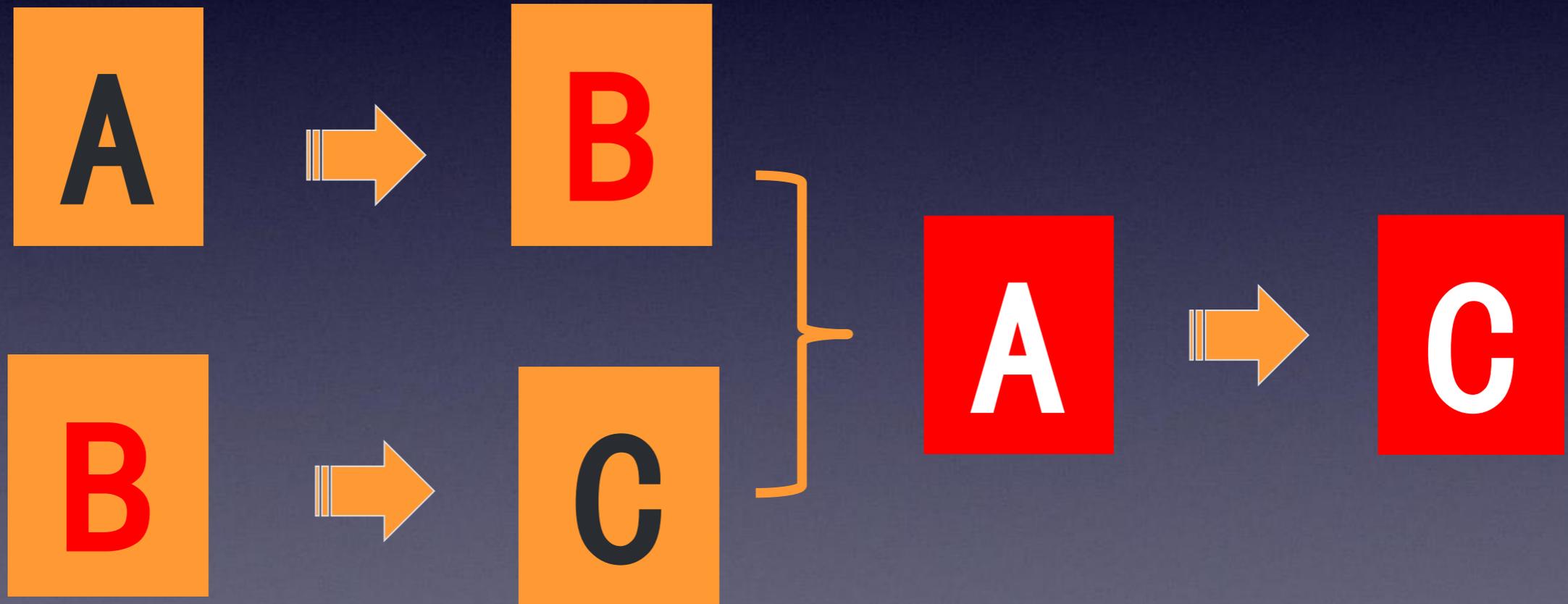
Cancer is a major cause of death. Common chemo- and radiation-therapies damage healthy tissue and cause painful side effects. The enzyme horseradish peroxidase (HRP) has been shown to activate the plant hormone indole-3-acetic acid (IAA) to a powerful anticancer agent in *in vitro* studies, but gene directed enzyme prodrug therapy (GDEPT) studies showed ambivalent results. Thus, HRP/IAA in antibody directed enzyme prodrug therapy (ADEPT) was investi-

植物根 IAA/H<sup>+</sup>  
同时检测

人体乳腺肿  
瘤组织 O<sub>2</sub>/H<sup>+</sup>  
同时检测

# 学术和技术突破

new Developments



# 学术和技术突破

new Developments

已有知识



新知识

