



# NEW TECHNOLOGY FOR FOOD TESTING -NGS ( NEXT GENERATION SEQUENCING) 下一代测序技术在食品检测中的运用

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WHEN YOU NEED TO BE SURE



- ❑ Next generation sequencing (NGS)

二代测序技术

- ❑ NGS application

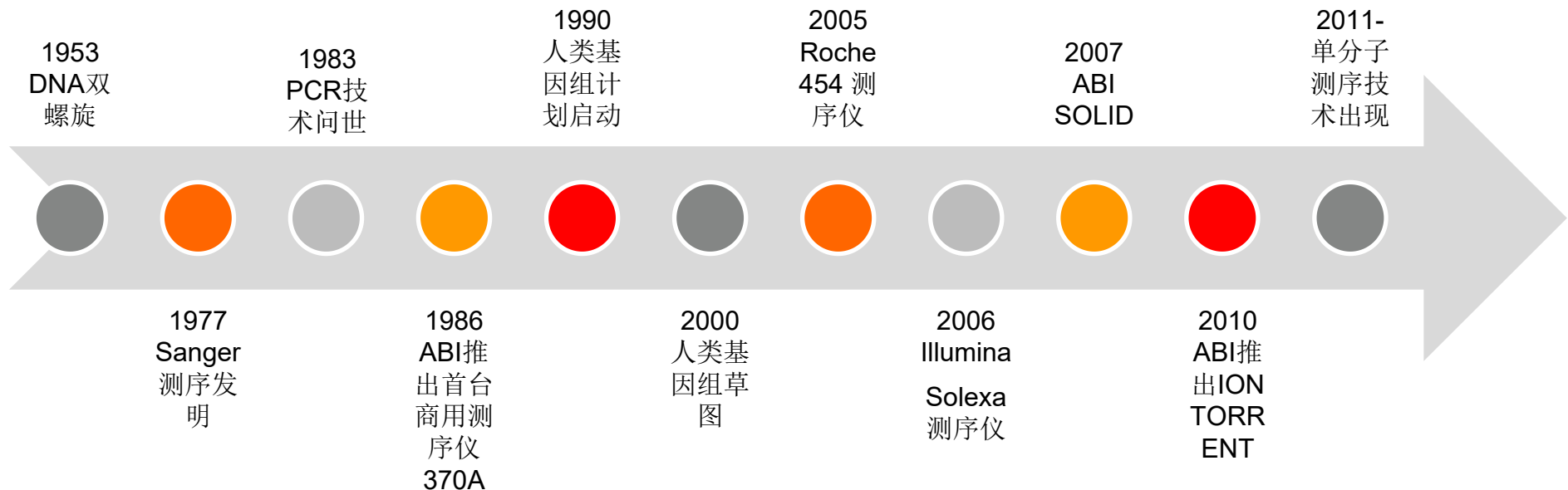
NGS技术的应用

- ❑ Extension in food industry

如何在食品工业中拓展其应用

- DNA sequence is the basis for gene structure and function research and application

DNA序列测定是对基因结构及功能研究和认识的基础



### Sanger

- 单核酸片段测序
- 双脱氧末端终止法
- 毛细管电泳测序
- 荧光信号

一代测序

- 测序序列长 long reads
- 生物信息分析简单 easy results analysis
- 结果直观

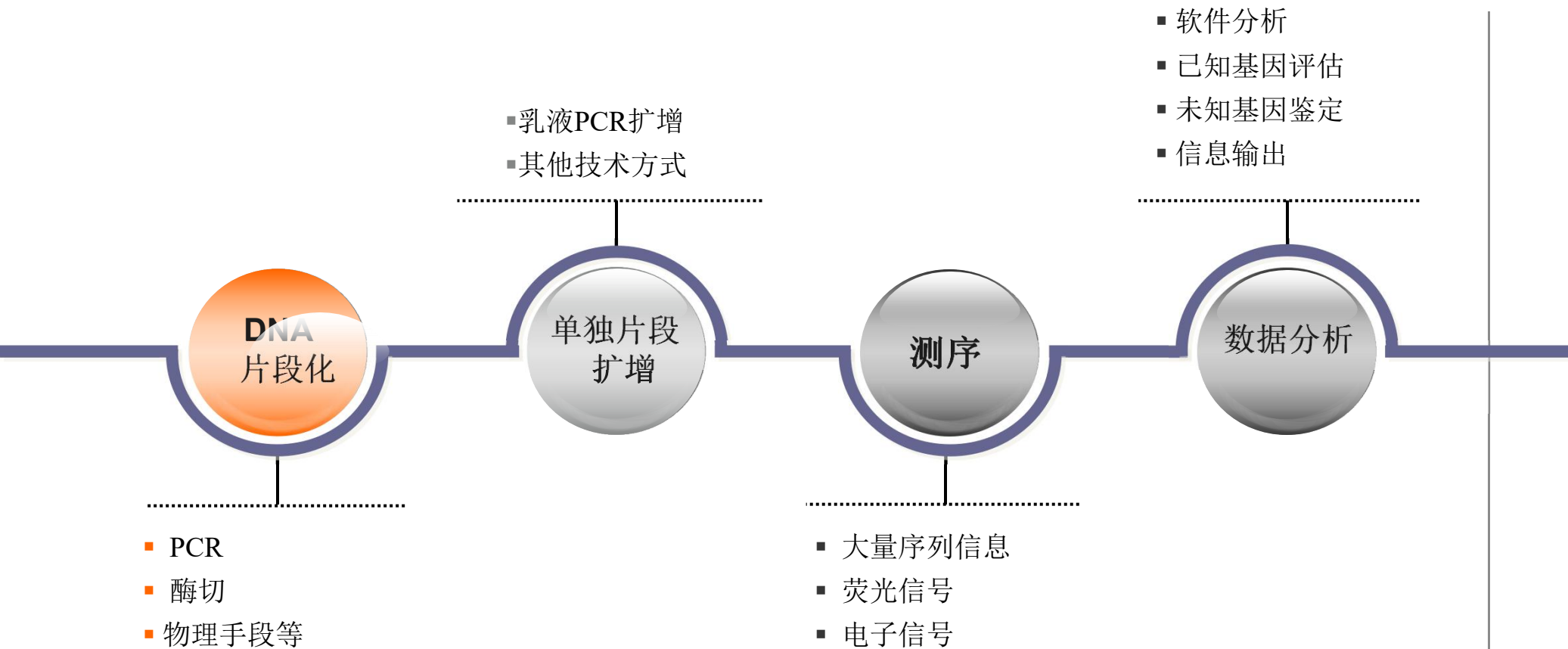
### NGS

- 高通量测序
- 大规模并行
- 边合成边测序
- 荧光信号或PH值变化

下一代测序

全基因组水平  
等大规模筛选  
和研究

- 序列多，序列长度短 high throughput, short reads
- 信息分析复杂 bioinformatics for results analysis
- 大数据检测，成本低 big data, low cost



**BIOLOGICAL &  
CLINICAL**  
分子生物和临床

1. Genome sequencing  
基因组测序
2. Transcriptome sequencing  
转录组测序
3. Exon sequencing  
外显子测序
4. virus and drug resistance  
病毒及病毒耐药性研究
5. Genetic diagnosis  
疾病及癌症诊断

**PUBLIC  
HYGIENE**  
公共卫生

1. Bacterial genome sequencing  
细菌基因组测序及菌株分型
2. virus genome sequencing  
病毒基因组测序及分型
3. Metagenome research  
宏基因组技术
4. Drug resistance of microbe  
微生物耐药突变检测

**AGRICULTURE**  
农业

1. Plant genome sequencing  
植物基因组测序
2. Resource conservation and molecular breeding  
资源保护和分子育种
3. Animal and aquatic animal genome sequencing  
畜禽及水产动物基因组测序
4. Animal genetics and breeding  
动物遗传育种

# NGS APPLICATION IN FOOD INDUSTRY

**Food  
Adulteration**  
食品掺假掺杂

**Microflora  
Analysis**  
微生物菌群分  
析

**Plant  
Species** 植  
物源性食品及  
原料的鉴定

**Other  
Aspects**  
食品过敏原等



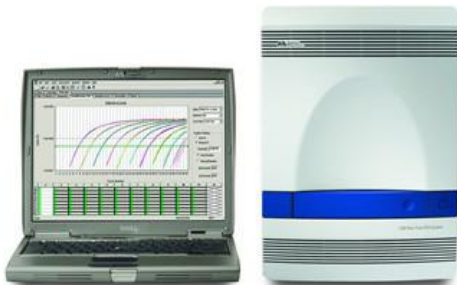
## ON FOOD ADULTERATION

### 食品掺假掺杂

- Identification on meat, dairy, fish and aquatic products  
对肉制品、乳制品、鱼种、水产品的鉴定
- To assist on the government supervision, supplier management of supermarket and e-commerce platform  
协助政府监管，商超及电商平台对供应商管理

**One test, All species**

#### Real time PCR 实时荧光PCR



**GB/T 25165-2010; SN/T 2051-2008; SN/T 1961**

**Limited number of Targets 有限目标物**

**Results only for the targets screened 得到检测目标物**

#### NGS 下一代测序技术



**Untargeted approach 全扫描方法**

**Hundreds of targets can be detected simultaneously – You can detect any kind of species, even unexpected ones ! 得到样品中所有目标物**

### TESTS METHOD / RESULTS

Test: Identification of multiple MEAT species by DNA sequencing \*  
Method: NGS

<b>Result:</b>	Gallus gallus (Chicken) Ovis aries (Sheep) Sus scrofa (Porc) Bos taurus (Cow)	* 拉丁学名+俗名
<b>Result More 1%:</b>	Gallus gallus (Chicken) 34,7% Ovis aries (Sheep) 28,3% Sus scrofa (Porc) 24,4% Bos taurus (Cow) 12,6%.	* 相对定量结果



# MICROFLORA ANALYSIS

## 微生物菌群分析

- Identification of unknown microbe  
未知微生物的鉴定
- Identification of microflora in products and environment  
对产品环境中的微生物菌相进行鉴定分析
- Research on production technical, shelf-life, product taste  
产品工艺，保质期及产品风味等研究

Pure cultures ?  
Not necessary!



# IDENTIFICATION ON PLANT SPECIES

## 植物源性食品及原料的鉴定

- Identification of Chinese traditional herbs  
传统中药材鉴定 (掺假和标识不规范)
- Identification of flavoring, coffee and other plant source products  
其它一些植物源性产品的鉴定
- Application on health food production  
保健食品原料应用
- Application on novel food review  
应用于新食品原料的鉴定及辅助申报



## **OTHERS**

### **其他应用**

- Food allergen labeling
- 协助食品过敏原的正确标识
  
- Assist on investigation in food safety incidents
- 协助食品安全事件中病原菌的确定

**SGS NGS LAB INTRODUCE**



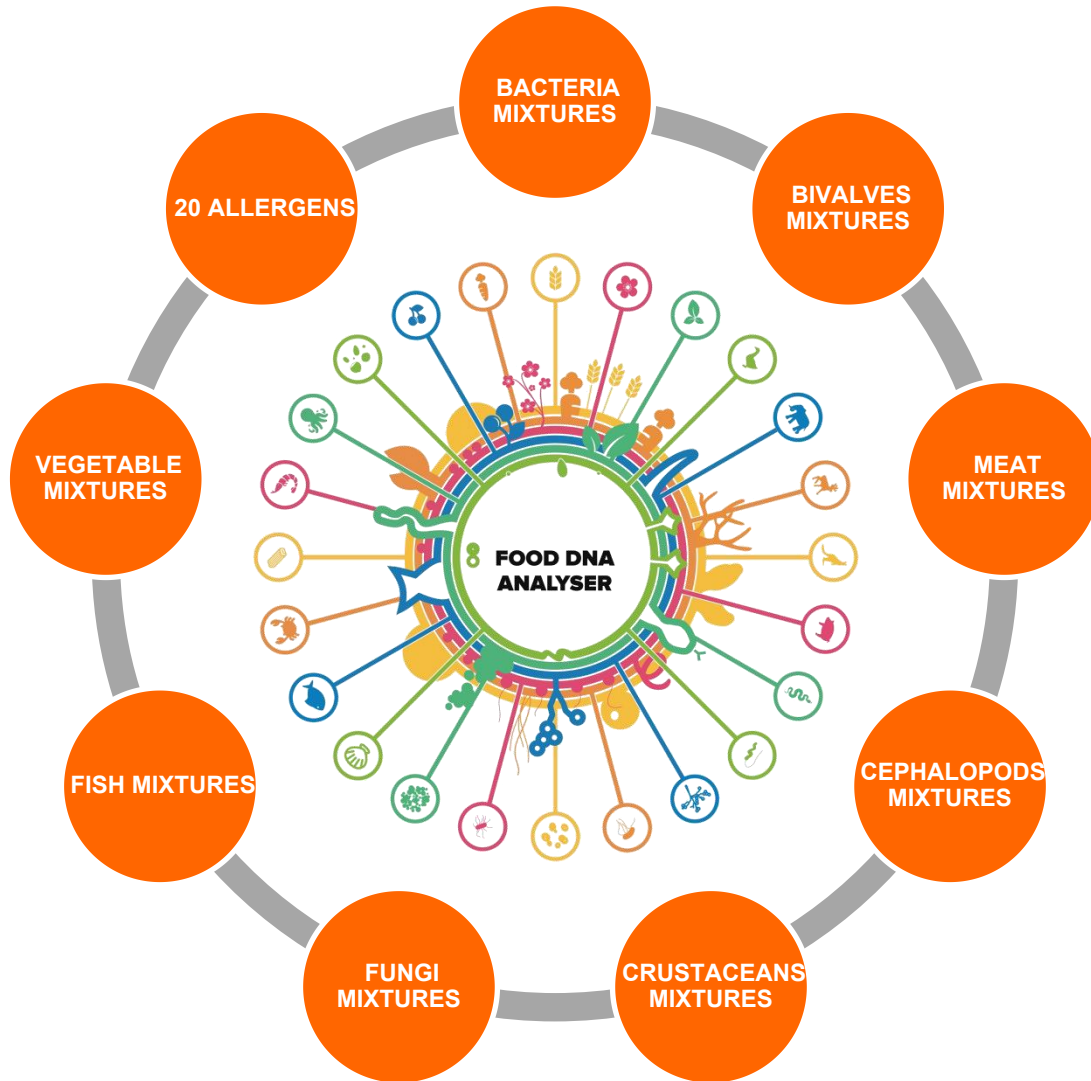
- Located in Portugal/Lisbon  
实验室位于葡萄牙里斯本
- ISO 17025 Accreditation (PCR, DNA sequencing including NGS)  
ISO17025资质认证实验室（包括PCR及NGS）
- Leading all ISO working groups about NGS for food products  
ISO国际组织 NGS在食品领域工作组领导者



- Agriculture & Food lab, Guangzhou branch  
广州分公司农产食品部实验室
- Open service **in October**  
实验室对外服务于**10**月份开始
- Promoting the NGS standardization  
积极促进NGS的标准化工作

## SPECIES SERVICE CATEGORIES

目前提供的物种检测鉴定服务分类



- 9 categories 9大类:
  - Meat 动物源性
  - Fish 鱼种
  - Seafood – Crustaceans 甲壳类
  - Seafood – Cephalopods 头足类
  - Seafood – Bivalves 双壳类
  - Plants 植物源性
  - Micro-organisms – Bacteria 细菌
  - Micro-organisms – Fungal 霉菌
  - Allergens (20, DNA based) 过敏原
  
- In the pipeline for 2017 研发中类别
  - Algae 藻类
  - Insects 昆虫类
  - Virus 病毒类



For further information,  
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*The future has already started...*

**SGS**

**THANKS!**