Creative Biolabs®

Introduction of Microfluidics

CONTENTS

01

PART ONE

History

The origin of microfluidic technology

History

1959

Microelectromechanical System（MEMS）

1990

Miniaturized Total Analysis System (μTAS)

1995

Caliper Life Sciences is established

2003

One of the 15 most important inventions affecting the future of mankind

2006

Nature-"Lab on a Chip" Album

02

PART TWO

Introduction

Detailed introduction of microfluidic technology

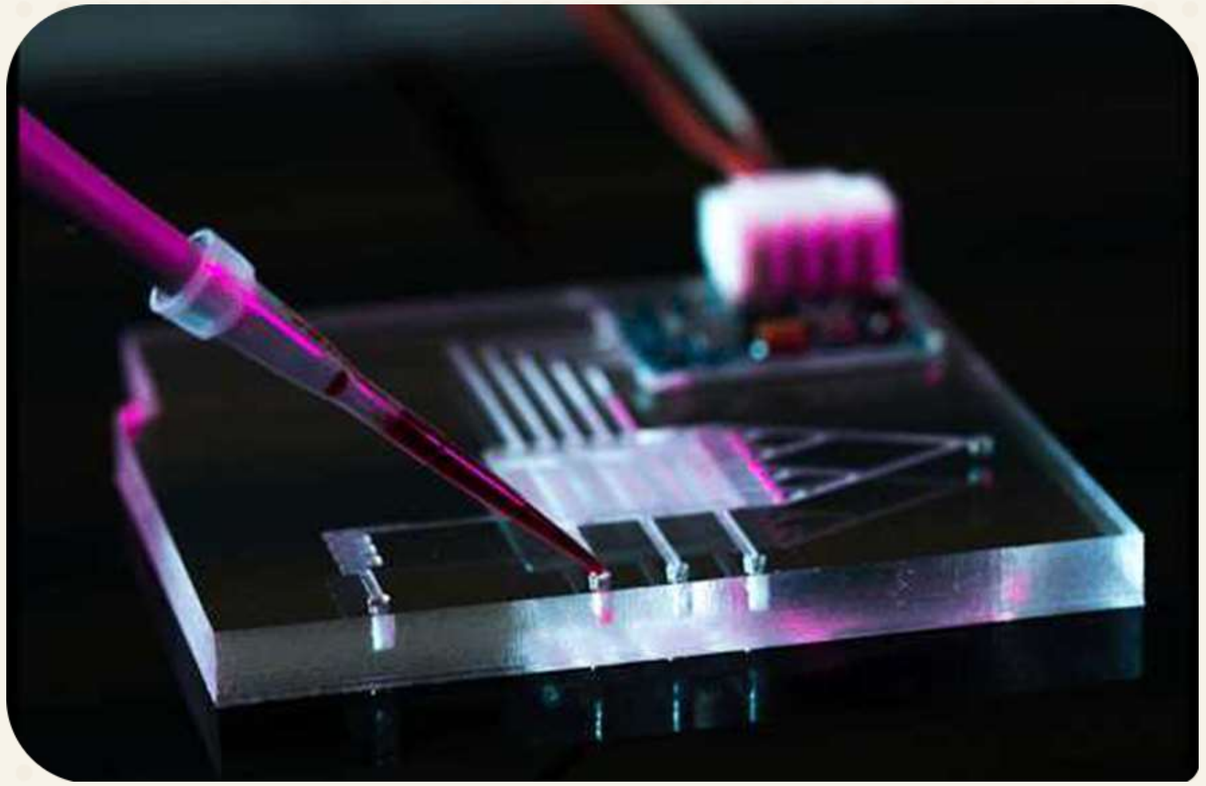
Introduction

Overview

Mechanism

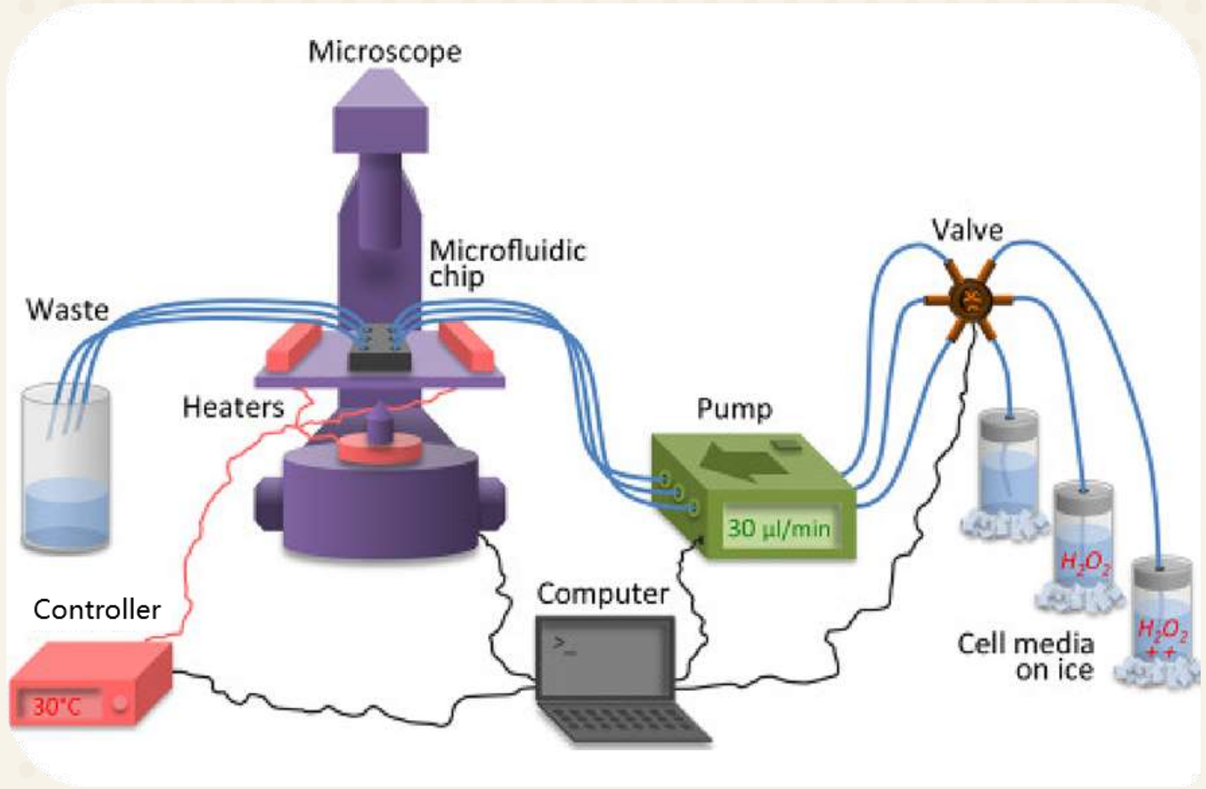
Components

Introduction-Overview



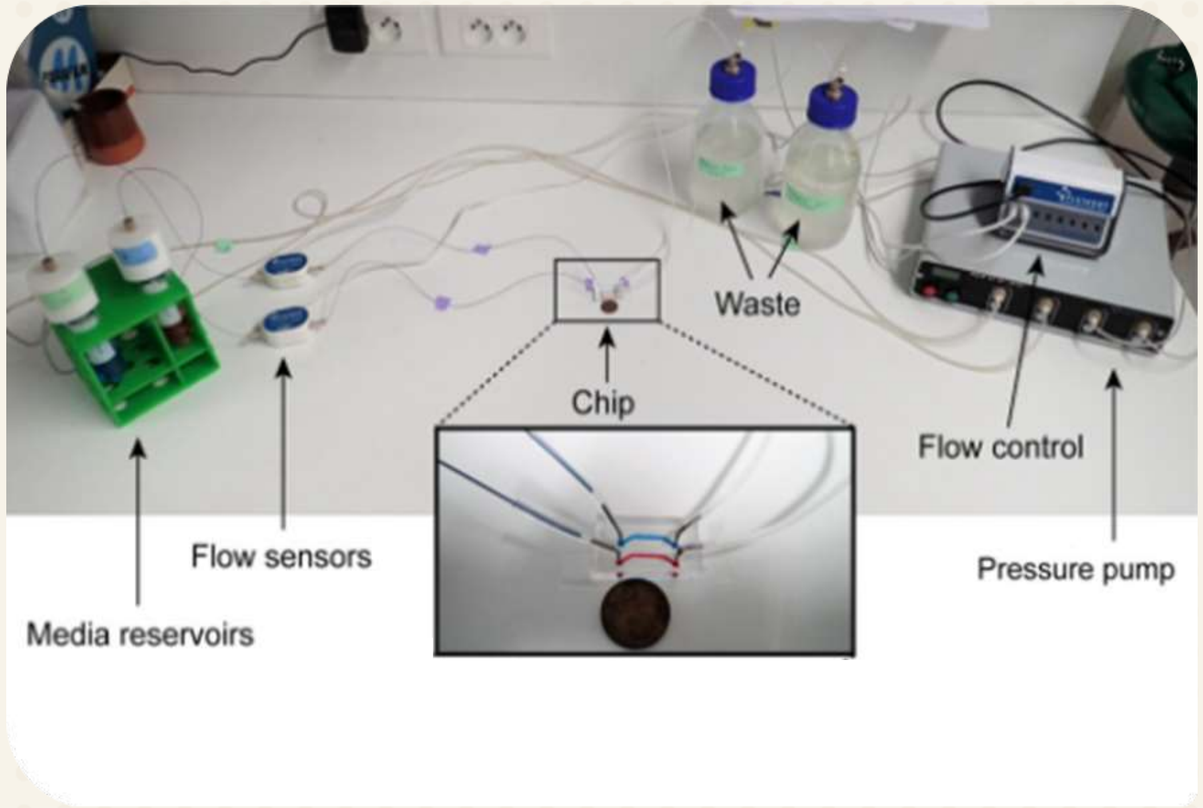
- **Microfluidic chip**
  Lab-on-a-chip，Biochip
- **Complete experiments quickly and automatically**
- **Complete chemical or biological laboratory**

Introduction-Mechanism



- Build a microfluidic system
- Reprinted to the chip
- Load biological sample and reaction solution
- React
- Detect

Introduction-Components



- **Microfluidic Pumps**

  Pressure pumps
  Peristaltic pumps
  Piezo-electric pumps
  Syringe pumps

- **Microfluidic Chips**
  - Material: Silicon, Glass, Organic polymer materials (PMMA), Paper materials
  - Channel: Single-channel, Multi-channel
  - Network Shape: Straight, Spiral, Curved snake, Polygon, Folded
- **Sensors**
- **Valve**
- **Tubing**

03

PART THREE

Features

Advantages and disadvantages of microfluidic technology

Features

Advantages

Integrated miniaturization and automation

High throughput

Low consumption of detection reagents

Small sample size demanded

Less pollution

Features

Disadvantages

01 Lack of specifications and standards on core technology

02 Serious shortage of relevant talents

03 High production costs

04 Difficulties of technology platforms

04

PART FOUR

Applications

Application of microfluidic technology

Applications

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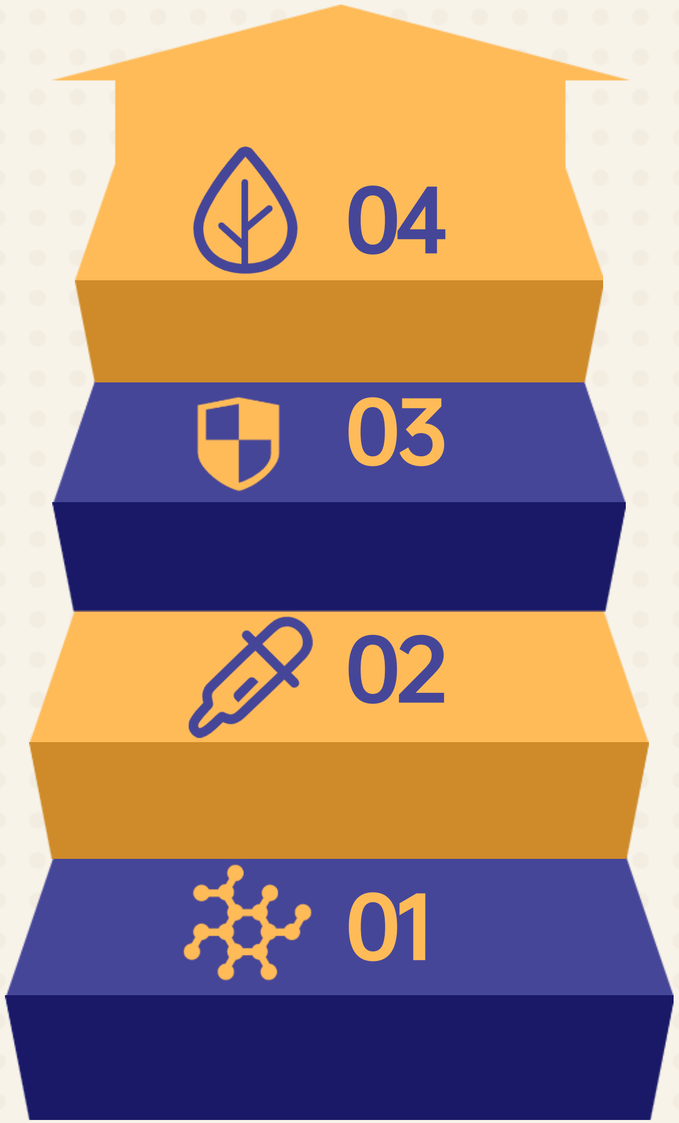

Environmental Monitoring

Electrochemical detection
Optical detection
Mass spectrometry (MS)

Food Safety

Pesticide residue
Pathogenic bacteria
Heavy metal
Food additives

Clinical Diagnosis

Analysis in pathogen detection
Analysis in cancer detection

Biology

Analysis in cell patterning
Analysis in exosome isolation

Creative Biolabs®

THANKS

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