

A pair of glasses and a pen are visible in the background, resting on a blue surface. The glasses are positioned in the upper left, and the pen is in the lower left. The background is a solid blue color with a subtle gradient.

浅谈环境中药物成分的管理

Brief introduction of Pharmaceuticals in the environment

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Q&A



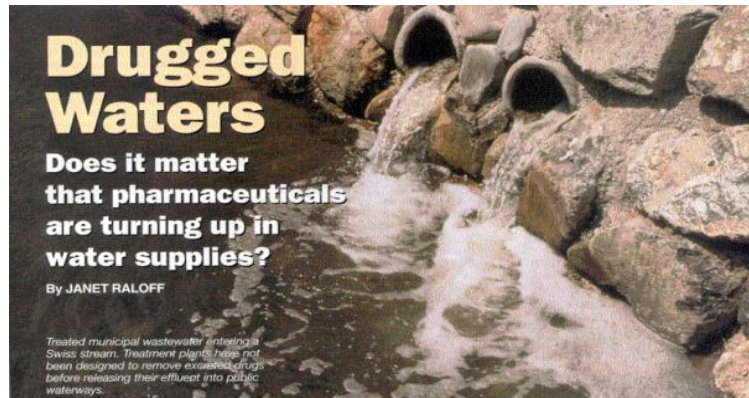
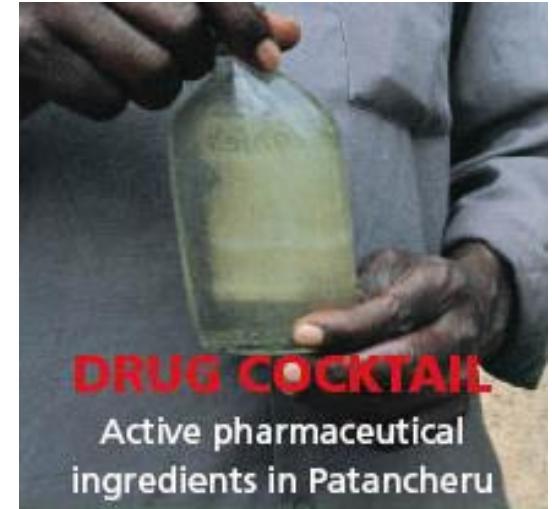
1-背景介绍 Background

越来越多的媒体在关注 Growing media attention



Water tested near Hyderabad contains some of the highest environmental drug levels known.

MAHESH KUMAR/AP



msnbc News | October 10, 2016

Drugs in your drinking water?

March 10: A shocking Associated Press investigation finds various pharmaceuticals in the drinking supplies of at least 41 million Americans. NBC's Tom Costello reports.



1-背景介绍

Background

□ 越来越严的规范在关注

Growing Regulatory Attention

1

欧洲食品药品监督管理局 Food & Drug Administration /European Medicines Agency
→ 新药的环境风险评估 Environmental Risk Assessment for new drugs

2

CDC和FDA发布报告：逐步淘汰抗生素用于动物的生长; CDC and FDA issued the report that phasing out antibiotics used in the growth of animals.

3

制药工业水污染排放标准, 包括化学合成类, 混装制剂类, 中药类, 生物工程类等
Discharge standard of water pollutants for pharmaceutical industry including the Chemical synthesis products ,Mixing/compounding and formulation category

4

2015年第四届国际化学品管理会议(ICCM4)声明药物在环境中的问题已成为全球化学品第6大威胁。PIE declared a “TOP 6”
Global chemical threat-the fourth session of the international Conference on chemicals management(ICCM4),2015



1-背景介绍

Background

□ 其他利益相关方的关注 (非政府组织, 客户等)

Other Stakeholder Concerns (NGOs, Consumers)

PSCI (Pharmaceutical supply chain initiative 制药工业供应链管理)

31家成员公司已经分享PSCI建立可靠的供应链管理愿景, 并致力于持续改进.....

31 member companies already share the PSCI vision for responsible supply chain management and are committed to continuous improvement.....



<https://pscinitiative.org/home>

2- 药物进入环境的途径与风险

Identify the entries way and risk of pharmaceuticals into the environment



2- 药物进入环境的途径与风险

Identify the entries way and risk of pharmaceuticals into the environment

⚠ 药物成分会影响水生生态系统 Pharmaceuticals may impact the (aquatic) ecosystem

⚠ 对声誉造成影响 Impact on reputation

⚠ 对产品造成影响...影响业务 Product risk ...impacting business

- 增加环境测试而延缓注册 Delayed registration due to changing guidelines, increased environmental testing
- 由于标签和优先处方而影响销售 Sales affected by labeling or prioritized formularies
- 客户未使用的药物反回系统 System for return of unused medicines by consumers

⚠ 法规...影响成本 Regulations...impacting costs

- 污水和饮用水的监控标准可能会导致处置成本的增加 Regulatory standards for effluent and drinking water may cause increased treatment costs

2- 药物进入环境的途径与风险

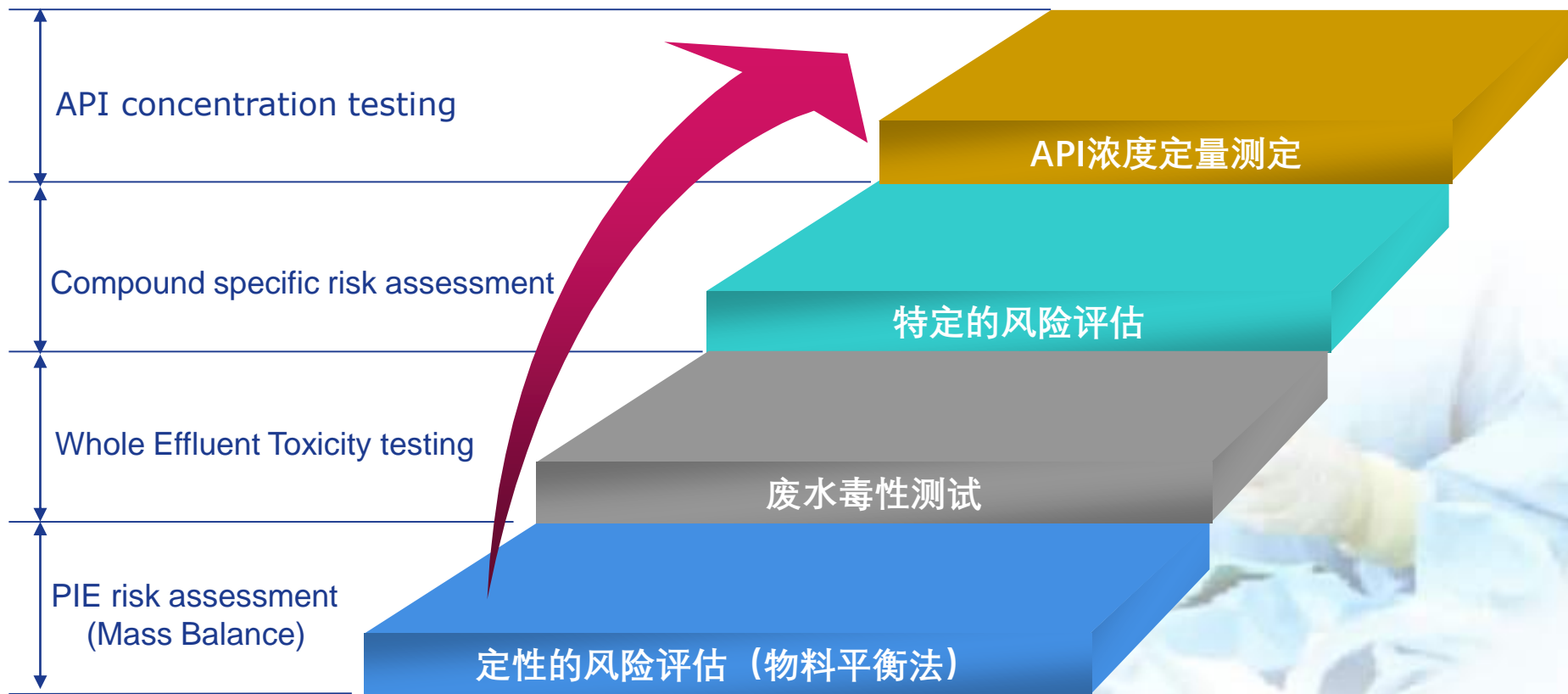
Identify the entries way and risk of pharmaceuticals into the environment

没有急性的影响，但有慢性影响的案例。
No 'acute' effects , but examples of 'chronic' effects



3-如何评估工业废水中药物进入环境的风险

How to assess the risk of pharmaceuticals of WWTP entries into the environment



4-如何控制、减少药物进入环境的风险

How to control and reduce emission of pharmaceuticals into the environment

风险控制Control risk

废水处理站
WWTP

危险废物
Hazardous
waste

大气
Air
emission

意识
Awareness

4-如何控制、减少药物进入环境的风险

How to control and reduce emission of pharmaceuticals into the environment

□ 从源头控制，例如：提高产品收率。“At source control”，for example: improve the product yield.

□ 培训员工，客户，消费者等正确的处置未使用的药物 Educate employee/customer/consumer on correct disposal of unused medicines

□ 未雨绸缪,提前收集产品数据信息，进一步和持续性检测废水并评估环境影响

Don't have your cloak to make when it begins to rain. Continued and extended Monitoring , developing Data for our products & assess their environment impact

□ 与其他利益相关方机密合作与沟通 Collaboration and communication with Other stakeholders.

□ 提升废水处理工艺，减少危险废物的产生，减少粉尘大气排放 Improve the WWTP process, reduce the drug waste amount ,reduce the drug dust emission

4-如何控制、减少药物进入环境的风险

How to control and reduce emission of pharmaceuticals into the environment

□ 末端处理，常见技术 End treatment --“Common” technologies

1

活性炭吸附
Activated carbon



Activated carbon

2

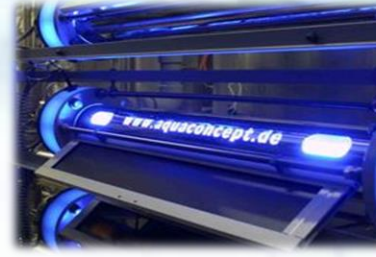
生物膜反应器+高级氧化处理(例如紫外线/过氧化氢/臭氧)
Membrane Bioreactor + Advanced Oxidation Treatment (e.g. UV/peroxide/ozone)



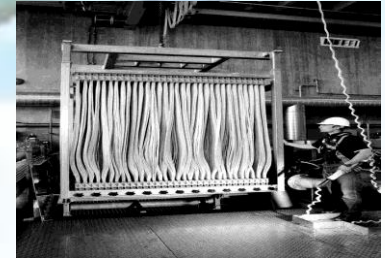
MBR + ozone treatment

3

超滤/纳滤/反渗透
Ultrafiltration/Nanofiltration/Reverse Osmosis



UV pre treatment



Q&A



Thank You !

