

Conference 2016

Strengthening AMR R&D by coordination, cooperation and knowledge exchange

Antibacterial drug
research-discovery-development

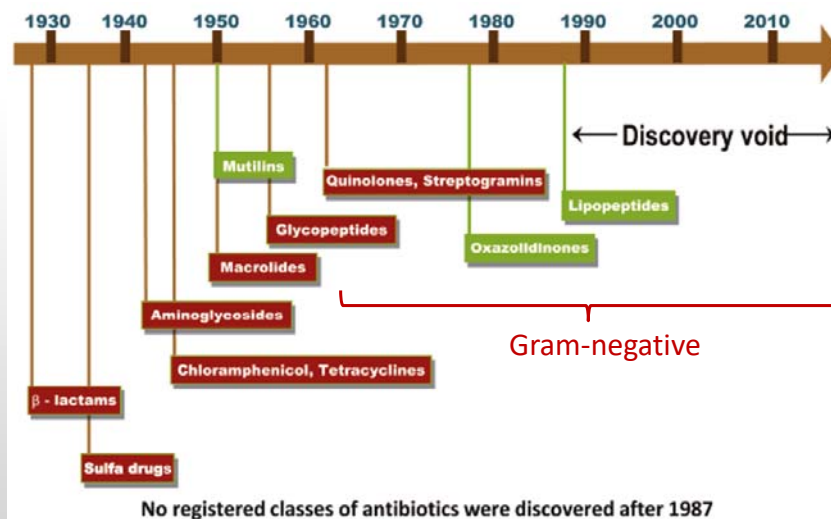
U. Theuretzbacher – Center for Anti-Infective Agents, Vienna, Austria

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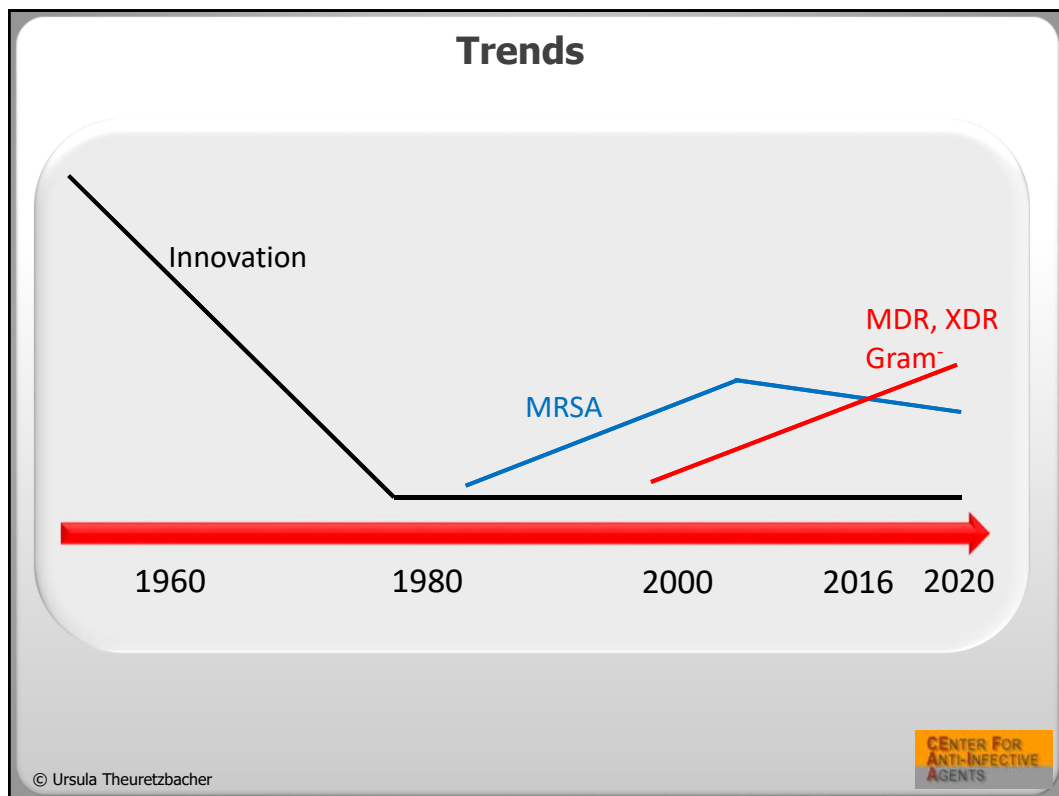
Innovation gap and discovery void



L. Silver

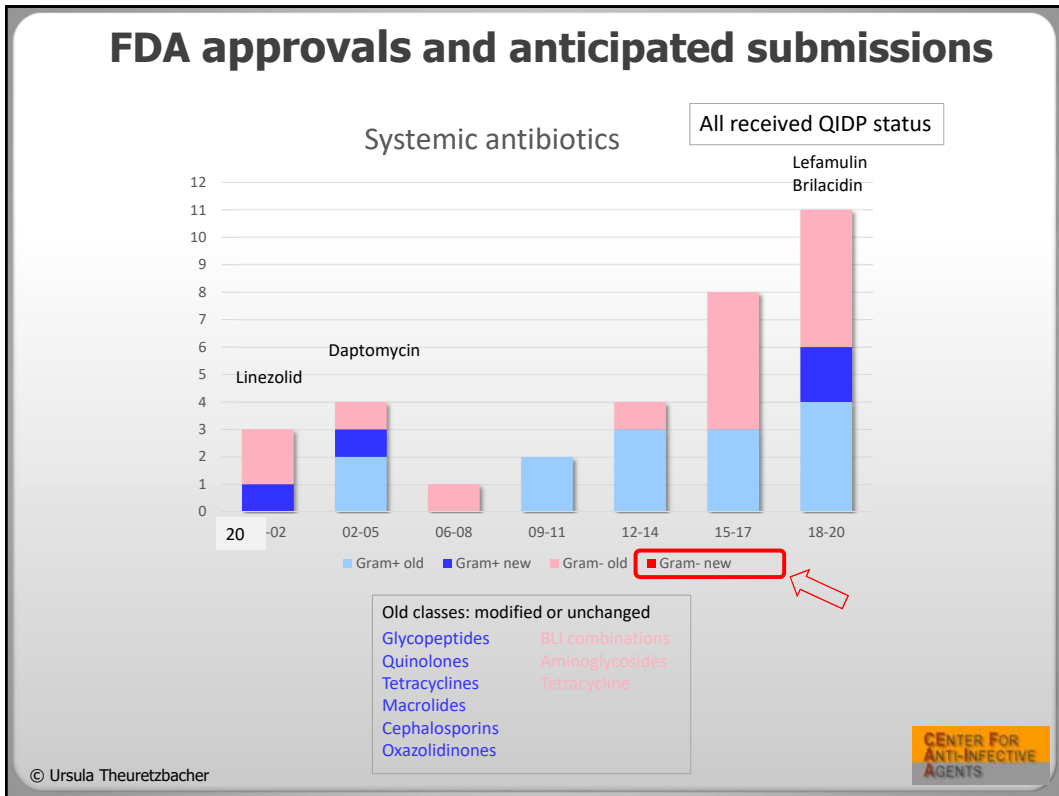
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Why can't we find novel antibiotic classes?

- Bacterial genomic era and less suitable compound libraries
 - 1995-2001 GSK evaluated more than 300 genes, 70 high-throughput screening campaigns (D. Payne)
 - PDF inhibitors (rediscovery), FabI-inhibitors
 - No good leads for Gram-negatives
 - Level of success unsustainably low, 4-5 times less than in other fields
 - Level of low success similar in other companies
- Gram-negatives



Rescue?

Adjunctives

- Need active antibiotic
- More complex

Alternatives

- Antibodies
- Prevention

Civil Society

Synergene

Microbiome

E. coli bacteria via EdBites

Phages

Cocktail of Bacteriophages

CRISPR/Cas9

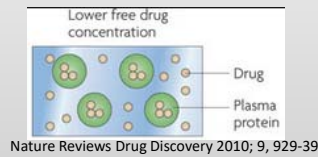
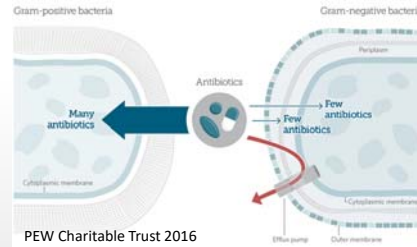
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Solutions – Discovery challenges

Addressing fundamental gaps in basic research

- Gram-negative pathogens
- Rapid emergence of resistance
 - Example GSK2251052
- Pharmakokinetik: Protein binding
- Compound libraries

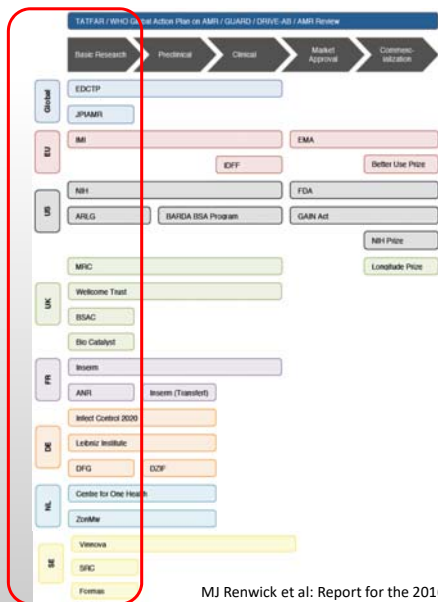


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Research - Initiatives

Existing initiatives are fragmentary, not sufficiently coordinated



MJ Renwick et al: Report for the 2016 Dutch Presidency of the EU

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Set priorities – WHO initiative

Pathogen priority list for R&D based on

- Global scope
- Evidence, consensus
- Public health threat (epidemiology, impact of resistance)
- Therapy options
- Challenges of discovery and development

AMR Global R&D Priority Pathogens Project

- WHO: University of Tübingen, Germany
- Newest epidemiology studies, databases (DRIVE-AB, COMBACTE-Net), reviews
- Global expert network, consensus
- Prioritisation methods

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Research – Coordinate funding strategies

Prioritise and define research questions

Top-down funding strategies



Filling key gaps in knowledge
to support drug discovery

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Research – Coordinating

- Non-profit organization with dedicated, full-time scientific leadership team
 - Coordinate and directly manage a multi-disciplinary global research effort
 - Set priorities of research questions
 - Direct and manage milestone-driven research
 - Virtually integrate research from across public and private sectors
- Sustainable funding through existing channels and dedicated funds

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Research - Sharing

Sharing

information

expertise

materials

across the research community and

between sectors



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Discovery – Cooperating, sharing

- **Coordination, cooperation and knowledge exchange:**
Universities, publicly funded research institutions,
pharmaceutical companies (selected programmes)
- **Knowledge sharing:**
Customised compound libraries, assays, discovery guidelines
- **Non-profit umbrella:**
Coordination of public-private partnerships

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Non-profit research organisations



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