Initiatives to support AMR related research in the EU


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Anti-Microbial Resistance (AMR) challenge

- AMR recognised as a very serious health issue.

- European Medicines Agency (EMA) and the European Centre for Disease Prevention (ECDC)*:
  - \( \approx 25,000 \) patients estimated to die in the EU from an infection due to multidrug resistance bacteria.
  - These infections lead to €1.5 Billion cost/year (loss of productivity, extra health care costs)

- Impact of AMR in animals (health, welfare, economics): ?

- AMR challenge is a "One Health" and a global issue to be tackled from many different angles

EU research project funding – state of play

- €600 million for projects related to antimicrobial resistance FP5 – FP7 (1999-2012)

- Priorities:
  - developing new strategies for prudent/rational antibiotics use in medicine and agriculture
  - understanding how antimicrobial resistance develops
  - testing new antimicrobial drugs and alternatives to antibiotics
  - developing diagnostic tests to determine whether and which antimicrobials to prescribe
EU Investment in Research

- Transnational scientific collaboration
- Integration, pooling of resources
- Transfer of know-how, mobility of researchers and training

EU research funding has been crucial for:

5% EU 27
95% National (public + private)
Co-operation between EU Member States: Joint Programming Initiative on AMR

- Pulls together national research efforts, uses public resources better, and tackles key challenges
- 17 European countries and Israel involved
- Coordination of national research activities
- Development of a common vision and strategic research agenda by 2013
- Implementation of joint activities expected in 2013
- *This initiative is not exclusively focused on the human side*
Co-operation with the industry in human sector: Innovative Medicines Initiative (IMI)

- An opportunity to combine public and private resources for new antimicrobials
- Already funds a €14.5 million project to improve rapid point-of-care tests for appropriate use of antibiotics (www.rappid.eu)
- May 2012 (6th call): Launched a €223.7 Mio research programme (NewDrugs4BadBugs) to develop and speed up the delivery of new antibiotics; Dec 2012 (on-going 8th call): €136.7Mio for 2 AMR topics

www.imi.europa.eu
EvoTAR project: Evolution and Transfer of Antibiotics Resistance

A cross cutting project with One Health perspective:
EvoTAR aims to characterise the human reservoir of antibiotic resistance genes (“the resistome”) by investigating the dynamics and evolution of the interaction between resistant and non-resistant bacteria from the human microbiome and the interrelations of the human resistome with environmental, animal and food reservoirs of resistance genes.

• Novel methods used to quantify resistance transfer under controlled conditions. Mathematical modelling applied to predict gene flow between different reservoirs and, consequently, to make a prognosis of future resistance trends. Study of the efficacy of novel intervention approaches aimed at reducing selection and spread of antibiotic resistance.

• 17 partners from 7 EU countries.
• €12Mio EU contribution (overall budget €16Mio)
• Started on October 1st 2011 for 4 years
• www.evotar.eu
Anti-Microbial Resistance (AMR): Food production and livestock management

- Ban of the use of antimicrobial growth promoters in feed as from 2006.

- EU Research projects with 2 main objectives:
  - alternative products and strategies (e.g. plants extracts; bacteriophages; vaccines...), mostly for food-borne pathogens
  - changes of production systems (e.g. investigating gut function, genetic resistance to disease).

Also, development/validation of testing methods (AGPs, AMR)
Some FP7 projects on animal production/health with potential impact on AM use

- Endemic diseases: e.g. PRRS (PoRRSCON), Tuberculosis (TB-STEP)
- Poultry: CamCon (Campylobacter in poultry farming)
- Dairy cattle:
  - Genetics for robustness: Robustmilk
  - Health management / mastitis: IMPRO
  - Genetics for resistance to mastitis: Quantomics (+APEC in broilers); 3SR (+nematode resistance)
- Mortality of piglets (host-microbe interactions): InterPlay
- Precision Livestock Farming (automatic recording of health/welfare indicators): EU-PLF
- Neglected zoonoses: e.g. ICONZ
- Quick on field diagnostic tools: e.g. WildTech
ANIHWA ERA-NET

Increase cooperation and coordination of national research programmes on animal health and welfare, including fish and bees

Follow up to successful EMIDA ERA-NET (Animal Health)

- 30 partners from 19 countries.
- CA €2Mio EU contribution
- Started on January 1st 2012
- First transnational call for research proposals at the end of 2012: AMR one of the 4 topics (total +/-€14Mio)
4. Antimicrobial and anthelmintic resistance, and development of alternative curative and preventive therapies, like biotherapeutics and other potential alternatives.

The proposed study may include one or more of the following aspects:

- prevalence of resistance in gut (micro-)organisms,
- rapid tests for identifying resistance,
- analysis and mitigation of resistance genesis with emphasis on resistance critical for human infections,
- prudent use: strategies to reduce and prevent resistance development,
- ecology of drug resistant bacteria and transfer of antimicrobial resistance in livestock production and to humans,
- use of competitive flora, prebiotic feed, and other biotherapeutics or potential alternatives,
- control of infections and eradication plans.
EMIDA ERA-NET

2 joint calls with AMR related topics

Provisional Outcome of Second EMIDA Call - 2011
Activity Line D - Antimicrobials and anthelmintics: resistance and alternatives for use
- **Project title:** CARES - Coping with anthelmintic resistance in ruminants
- **Project title:** MINAPIG - Evaluation of alternative strategies for raising pigs with minimal antimicrobial usage: Opportunities and constraints

Outcome of First EMIDA Common Call - 2010
Topic 2 - Zoonoses & antimicrobial resistance, excluding microbial safety of products
- **Project title:** LA-MRSA – Methicillin resistant Staphylococcus aureus lineages in primary productions: multi-host pathogen, spill-over and spill-back between animals and humans?
Research to combat antimicrobial resistance - key actions in the new action plan

Action plan against the rising threats from antimicrobial resistance, launched on 17 November 2011

• **Action 6:**
  to promote unprecedented public-private collaborative research and development to bring new antibiotics to patients

• **Action 11:**
  Reinforcing and co-ordinating research efforts

Antimicrobial resistance research in the last work programmes of FP7

A package of call topics for proposals supporting the aims of the Commission's Action plan were published in three Cooperation work programmes

- HEALTH-2013
- KBBE-2013
- NMP-2013

- 8 call topics
- Total budget over €100 million
Last call of FP7: topic KBBE.2013.1.3-05

Ecology of drug resistant bacteria and transfer of antimicrobial resistance throughout the food chain

- food chain as reservoir + disseminator AMR
- other transmission pathways (e.g. environment, wildlife, companion animals, humans)
- correlation with the use of AM substances
- assess animal health, animal welfare, food safety and economic impacts of AMR in the food chain
- address the environmental impact

Identify risk factors and propose actions.

EU contribution €9Mio
Final Thoughts

A lot is being done: enough? No
AMR will be a focus in the next Framework Programme for research (i.e. Horizon 2020, 2014-2020) currently in the legislative process. Also further National and Industry initiatives are needed

AMR a “One Health” issue: multi sectorial and multidisciplinary approach required; collaboration of human and veterinary communities (and beyond) is ‘a must’; involve all stakeholders (public and private)

AMR a global Issue: international collaborative research to be fostered

AMR a complex issue: prudent use is a cornerstone, but many other “keys”/components, in particular: assessing and monitoring situation and impact; disease prevention and control (prevention is better than cure); innovative approaches and products
Thank you

More info on Horizon 2020:

More info on FP6/FP7 animal health research projects:
"A decade of EU-Funded animal health research":