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COM A CIÊNCIA
E TECNOLOGIA
EM PORTUGAL

16-18 maio

Antibiotic resistance in One Health:
- the silent pandemic that threatens
people, animals and environment

Resistência aos antibióticos em One
Health:
- a pandemia silenciosa que ameaça
pessoas, animais e meio ambiente



Constança Ferreira Pombo

Centro de Investigação Interdisciplinar em Sanidade Animal e
Laboratório Associado para Ciência Animal e Veterinária



Antibiotic
Resistance
Lab



What is One Health?



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The health of people is closely connected to the health of animals and our common environment.



Antibiotic
Resistance
Lab



The two major drivers for antimicrobial resistance are:



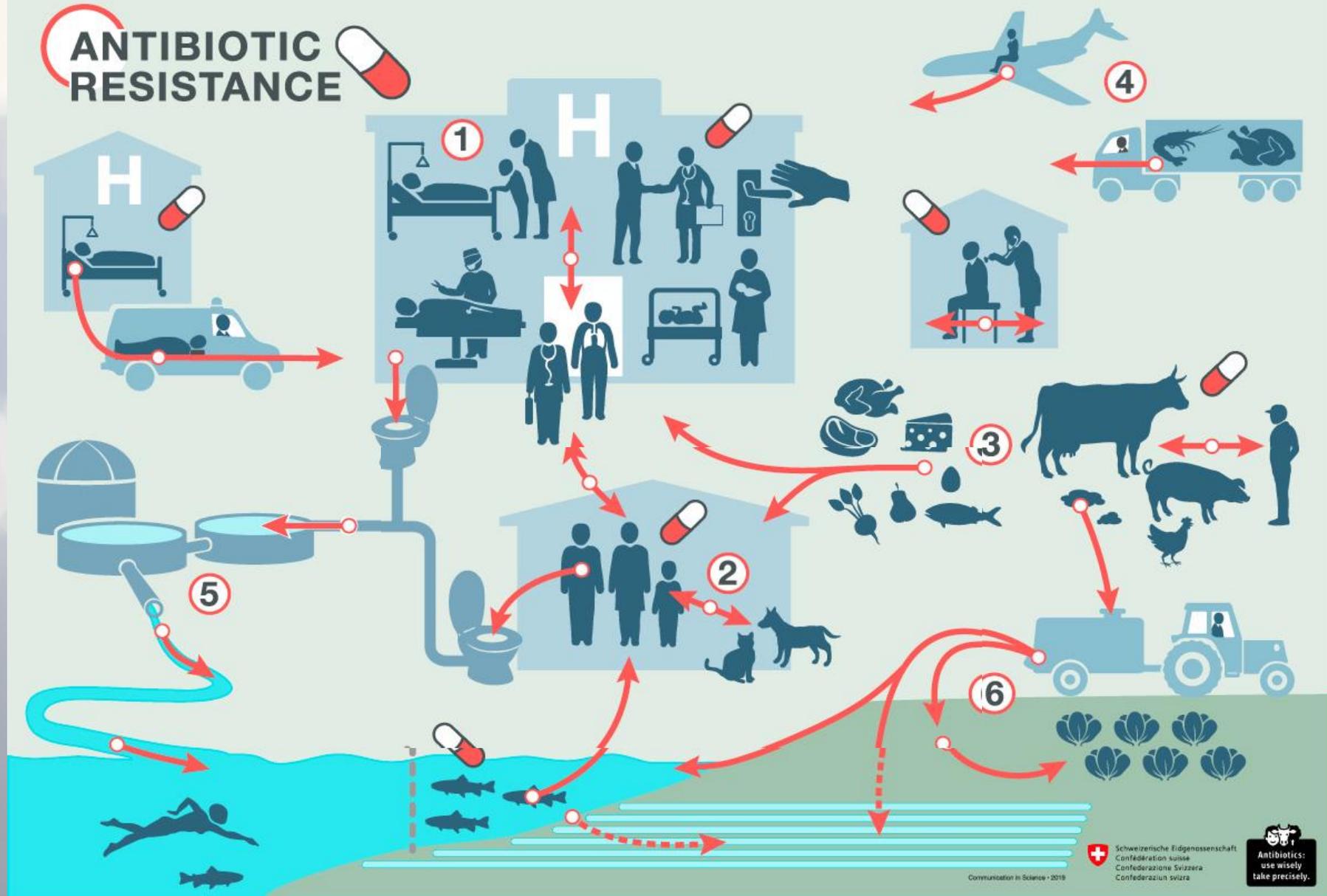
Use of antimicrobials, which exerts an ecological pressure on microorganisms and contributes to emergence and selection of antimicrobial-resistant microorganisms in populations;



Spread and cross-transmission of antimicrobial-resistant microorganisms between humans, between animals, and between humans and animals and the environment .



ANTIBIOTIC RESISTANCE



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Communication in Science • 2019

Antibiotics:
use wisely
take precisely.

Risk of companion animal to human transmission of antimicrobial resistance during different types of animal infection (PET-Risk)

 INTERVENTIONS

 SURVEILLANCE

 TRANSMISSION

[PROJECT PARTNERS](#)

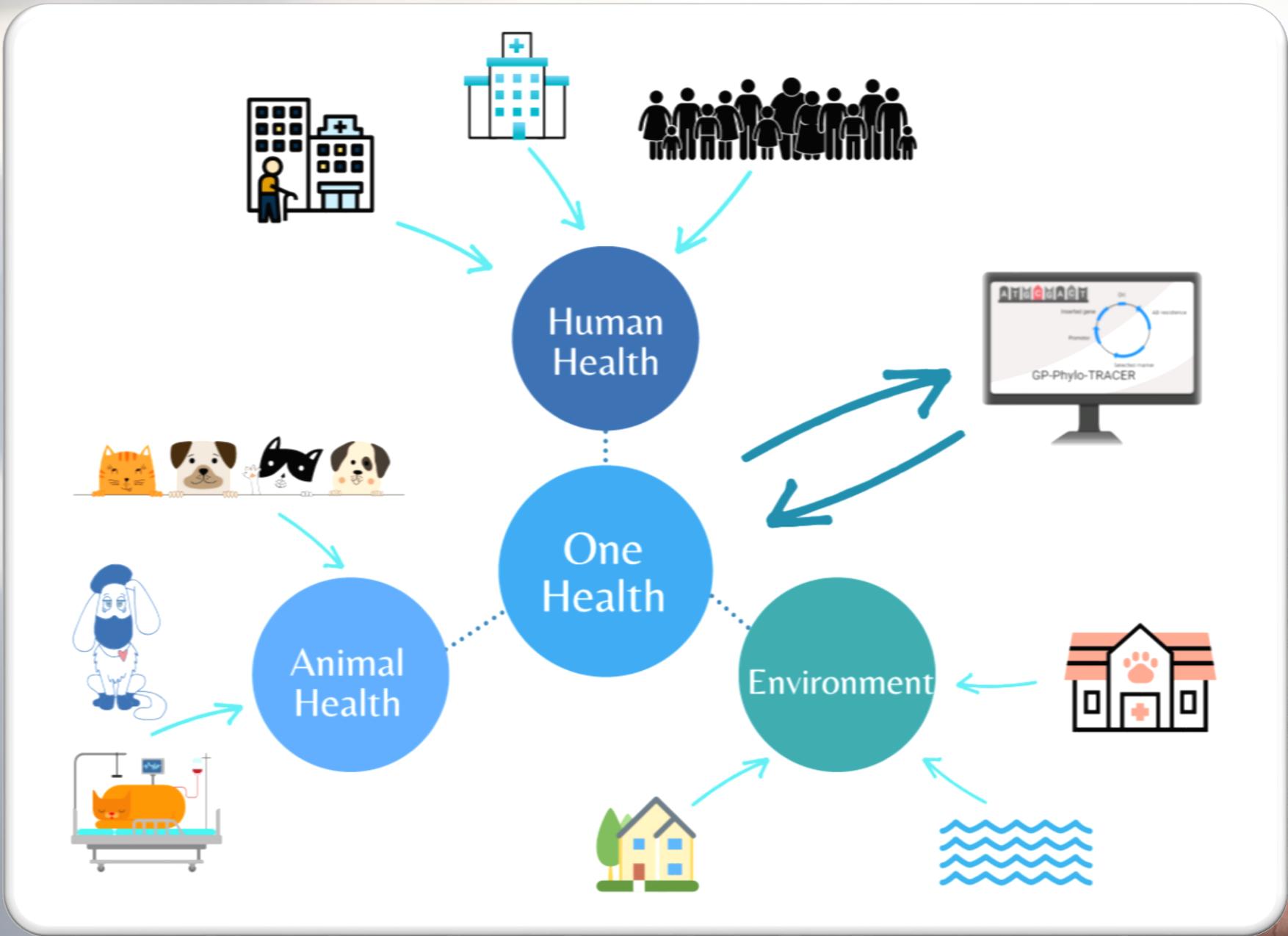
[PROJECT RESOURCES](#)

[PUBLICATIONS](#)

[CALL](#)

The close contact of pets with humans provides excellent opportunities for interspecies transmission of resistant bacteria and their resistance genes in either direction. Infections in humans due to antimicrobial resistant bacteria originating from pets are becoming a concern.

Completed project



A One-health approach:



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Using genomics to prevent carbapenem/colistin resistance transmission.



Which One-health setting is amplifying resistance?

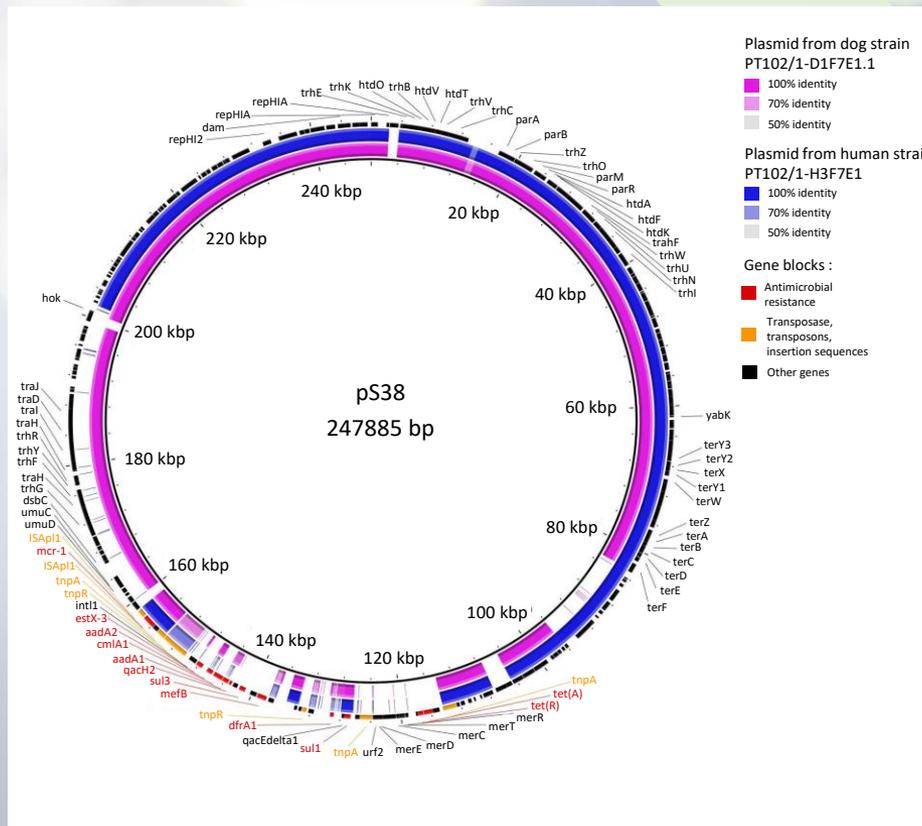


Recent outputs

- mcr-1* sharing between co-habiting dogs and humans in the community, Lisbon, Portugal, 2018-2020

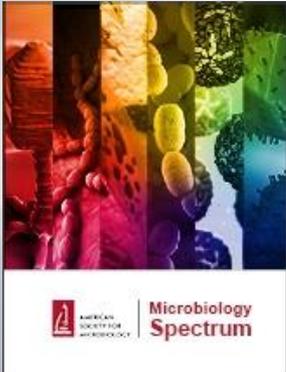


Juliana Menezes



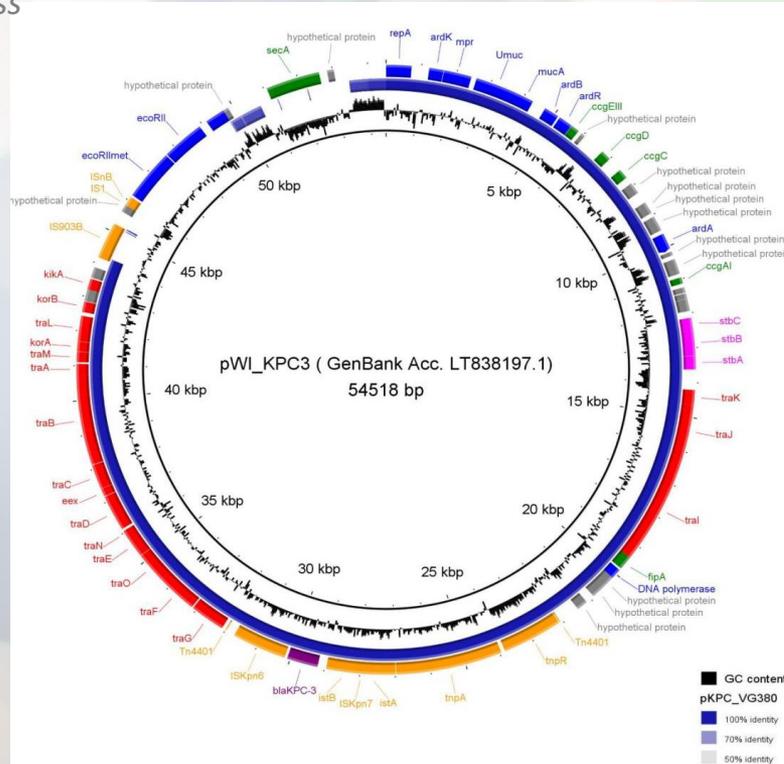
First report of a KPC-3-mediated carbapenem resistance in Sequence Type 392 multidrug-resistant *Klebsiella pneumoniae* associated with an upper respiratory infection in a dog

2022 In press

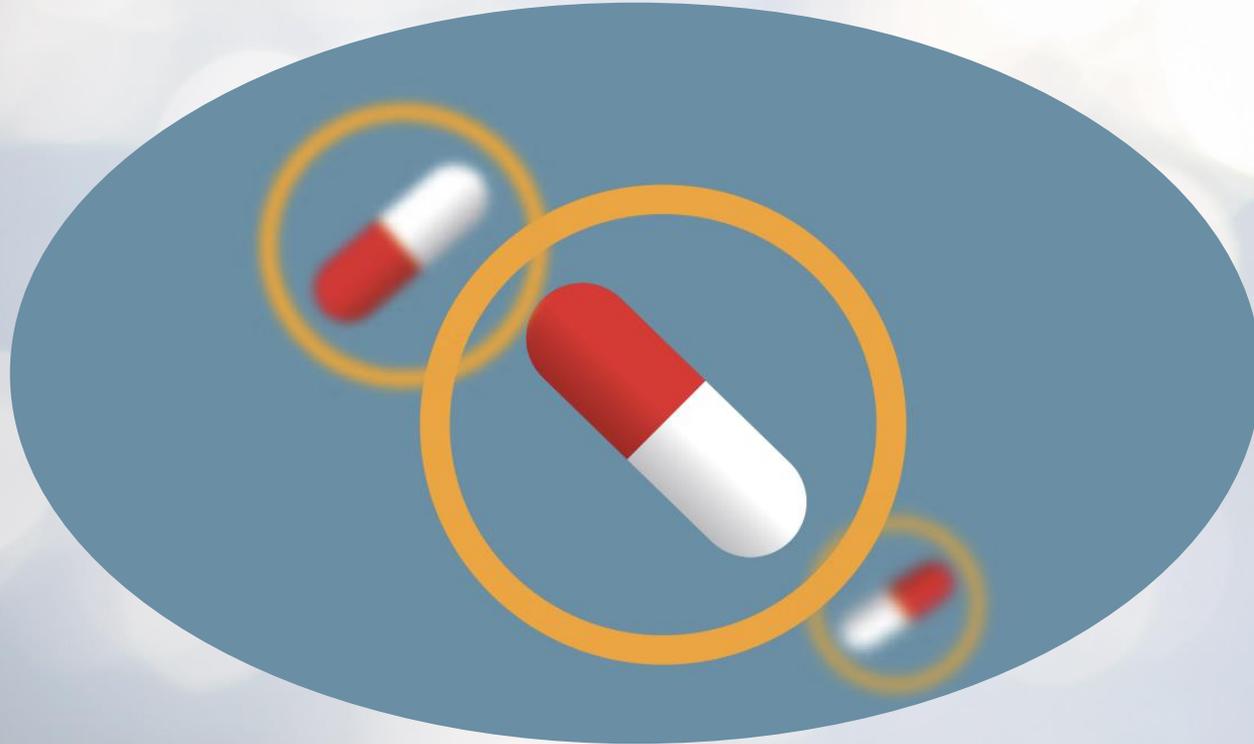


Joana Moreira da Silva

Figure. Plasmid alignment comparison between *de novo* assembled contig pKPC_VG380 (GenBank Acc. PRJNA808048) found on the strain KPC-3-producing *K. pneumoniae* taken from a dog's with an upper respiratory tract infection (in blue) and plasmid pWI_KPC3 (GenBank Acc. LT838197.1), used as backbone plasmid reference, previously described on a French nosocomial isolate (10). Genes are represented by colored blocks: purple, resistance gene; blue, DNA replication, regulation, and restriction systems; red, conjugation-association genes; fuchsia, genes associated with partition and stability systems; orange, transposons, insertion sequences (IS) and transposase genes; green, other genes; gray, hypothetical proteins. Image generated using BRIG 0.95, available at <http://brig.sourceforge.net/>.



To keep the 3 settings Healthy?



We need to restrict use and preserve antibiotics!!!



Acknowledgments



PET-Risk Consortium members:



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Dr Ana Mafalda Lourenço
Dr Inês Cunha e Silva
Dr Pedro Guilherme



Dr Siân-Marie Frosini
Dr Ruth King
Professor Anette Loeffler



Dr Michael Brilhante
Professor Vincent Perreten



Dr Claudia Feudi
Professor Stefan Schwarz



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Dr Katie Clow
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All dogs and cats and their families!