72 Resistance to last-resort human antimicrobial agents among gram-negative bacteria recovered from Barcelona Norway rats (Rattus norvegicus)

Marta Mari-Almirall¹, Yaiza Vallejo¹, Sara Sabaté², Sandra Franco², Laura Muñoz¹, Maria Nieto ¹, Clara Cosgaya¹, Jordi Pascual², Ignasi Roca¹, Tomás Montalvo²

¹Department of Clinical Microbiology and iSGlobal, Hospital Clinic - Universitat de Barcelona, Barcelona, Spain, tmontal@aspb.cat
²Pest Surveillance and Control, Agència de Salut Pública de Barcelona, Barcelona, Spain

Gram-negative pathogenic bacteria are shared between humans and animals but also the intra-and the inter-species exchange of genetic determinants of resistance are common between bacterial pathogens. Recent reports have identified multidrug-resistant bacteria from sewage samples in different parts of the world but there is no data regarding the potential role of urban rats as reservoirs and source of antimicrobial resistant bacteria that are relevant to human health. From January through November 2017, two hundred and twelve Norway rats (Rattus norvegicus) were captured with kill traps in different sections of the Barcelona sewers. Intra-rectal samples from captured animals were cultured on selective media for the isolation of ESBL and/or carbapenem resistant gram-negative bacteria. Species identification was performed by MALDI-TOF/MS and antimicrobial susceptibility was determined by disc diffusion, and Etest and microdilution when necessary, following EUCAST guidelines. Detection of genes encoding ESBL and carbapenemases was performed by PCR and Sanger sequencing. Pulsed-field gel electrophoresis was used to study the clonal relatedness of all isolates and MLST analysis was performed on selected isolates. Overall, 229 isolates were recovered and identified, in order of abundance, as either Escherichia coli, Klebsiella pneumoniae, Enterobacter spp., Raoultella ornithinolytica, Serratia spp., Citrobacter spp., and Pseudomonas spp. Resistance to extended-spectrum cephalosporins was high among Escherichia coli, Klebsiella pneumoniae and Enterobacter spp (>50%) associated with carriage of ESBL. Resistance to carbapenems was identified in roughly 10% of the isolates, mostly associated with carriage of KPC and NDM carbapenemases. Isolates with the same mechanism of resistance were clonally related but overall there was high clonal diversity. Our results show alarming levels of antimicrobial resistance to clinically relevant antibiotics among gram-negative bacteria colonizing the intestinal tract of Barcelona rats. Additional studies to analyze transmission of resistance mechanisms and bacterial strains between humans and urban rats are ongoing.
Julius Kühn-Institut
Bundesforschungsinstitut für Kulturpflanzen

Jens Jacob, Jana Eccard (Editors)

6th International Conference of Rodent Biology and Management and
16th Rodens et Spatium

Potsdam, Germany, 3-7 September 2018

Book of Abstracts
Editors:
Jens Jacob¹ and Jana Eccard²
¹Julius Kuehn Institute, Federal Research Centre for Cultivated Plants, Institute for Plant Protection in Horticulture and Forests, Vertebrate Research, Toppheideweg 88, 48161 Münster, Germany
²University of Potsdam, Institute of Biochemistry and Biology, Animal Ecology Group, Maulbeerallee 1, 14469 Potsdam, Germany

Local Organizing Committee:
Jana Eccard, University of Potsdam
Jens Jacob, Julius Kühn Institute, Federal Research Centre for Cultivated Plants, Münster
Daniela Reil, Julius Kühn Institute, Federal Research Centre for Cultivated Plants, Münster
Christiane Scheffler, University of Potsdam
Elke Seydewitz, University of Potsdam

Scientific organising committee:
Emil Tkadlec (Czech Republic); Frauke Ecke (Sweden); Grant Singleton (Philippines); Heikki Henttonen (Finland); Jana Eccard (Germany); Jens Jacob (Germany); Lyn Hinds (Australia); Prince Kaleme (Congo); Xavier Lambin (UK); Zhibin Zhang (China)

International Steering Committee Rodens et Spatium:
Abraham Haim (Israel); Alexey Surov (Russia); Ana Maria Benedek (Romania); Boris Krasnov (Israel); Emil Tkadlec (Czech Republic); Éric Le Boulengé (Belgium); Farida Khammar (Algeria); František Sedlčák (Czech Republic); Gert Olsson (Sweden); Grant Singleton (Australia); Heikki Henttonen (Finland); Jan Zima (Czech Republic); Jean-François Cosson (France); Linas Balčiauskas (Lithuania); Maria da Luz Mathias (Portugal); Molly McDonough (USA); Mustafa Sözen (Turkey); Nigel Yoccoz (Norway); Olga Osipova (Russia); Takuya Shimada (Japan); Víctor Sánchez Cordero (Mexico); Xavier Lambin (United Kingdom); Yasmina Dahmani (Algeria)

International Steering Committee International Conference of Rodent Biology and Management:
Andrea Byrom (New Zealand); Charley Krebs (Canada); Grant Singleton (Philippines); Jens Jacob (Germany); Jiqi Lu (China); Lyn Hinds (Australia); Nico Avenant (South Africa); Peter Banks (Australia); Peter Brown (Australia); Regino Cavia (Argentina); Rhodes Makundi (Tanzania); Roger Pech (New Zealand); Steven Belmain (UK); Sudarmaji (Indonesia); Zhibin Zhang (China)

Bibliografische Information der Deutschen Nationalbibliothek
Die Deutsche Nationalbibliothek verzeichnet diese Publikation

ISSN 1868-9892
ISBN 978-3-95547-059-3
DOI 10.5073/jka.2018.459.000

Alle Beiträge im Julius-Kühn-Archiv sind unter einer Creative Commons - Namensnennung - Weitergabe unter gleichen Bedingungen - 4.0 Lizenz veröffentlicht.

Printed in Germany by Arno Brynda GmbH, Berlin.