Curriculum vitae of Kasper Nørskov Kragh

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Qualifications

Master in Science (Biology 2012) from University of Copenhagen
PhD in health and medical science from University of Copenhagen ("Aspects of non-attached biofilm aggregates") (2015)

Employment

Assistant professor

Bacteriology

København N.

1 Feb 2012 → nu

Research

Research
During my scientific career I have focused my attention on how the phenotype of non-attached biofilm aggregates are involved and influences both pathogenesis as well as in vitro systems. I have been involved in showing how small aggregated clumps of bacteria are able to present all the aspects of surface attached biofilm. My research has helped eluted how bacteria are able to grow in small aggregates nature and as well as in chronic infection. I am highly skilled at developing and employing advanced staining techniques in combination with the use of a diverse range of microscopy technologies. My mantra has continuously been to expand on the information's gained through microscopy of bacterial infections, not only asking if bacteria are present in an infection, but how, where, and in what state they are in. In close relation to my affection for microscopic examination, I have been closely involved in the development of new innovative in vitro infection models, which as closely possible resembles the environmental conditions we can observe in the chronic infection themselves. Lately I have now casted my focus on the crippling illness of chronic infections caused by Borrelia ssp.

Research output

A total of 27 scientific peer-reviewed publications from 2011 – present in peer reviewed journals. According to Web of Science, cited 345 times and with H-Index of 10.
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Teaching and organization

I have taught and organized several courses and workshops both nationally and internationally; Teach the Course "Bacterial Biofilms and Their Role in Chronic Infections", University of Copenhagen, 2012, 2013. Teach a Workshop at ESCMID Eurobiofilm'15 on "In vitro biofilm models". Taught a Workshop at ASM biofilm 7 on "In vitro biofilm models". Organized and taught the 4th EWMA practical course in Biofilm Procedures, 2016. Teach the same course in 2014 and 2015. Organized and taught the Medical Biofilm Techniques 2016, ESCMID Postgraduate Technical Workshop

Social and NGO activity

During the days of studying at the University of Copenhagen I was highly involved in social and student political organizations. I was one of the founding members of an interdisciplinary scientific network "Collaborative Association of Life Science Students", CALIS, for University of Copenhagen. After completion of my studies I have continued my work for organizations with the aim to promote both scientific and social relationships between biologists, especially microbiologists in Denmark. This both as a member of the board of the Danish Microbiological Society, DMS, as well as an active member of the Danish study group on Biofilm. Since January 2018 I have served as Social Media Editor for the peer-reviewed journal APMIS – journal for pathology, microbiology and immunology.

Funding

Lundbeck Foundation; 20000 DKK, Travel grant for stay abroad during Ph.D. study
Knud Højgaards Foundation; 25000 DKK, Travel grant for stay abroad during Ph.D. study
Oticon Foundation; 15000 DKK, Travel grant for stay abroad during Ph.D. study

Research outputs

A requirement for flow to enable the development of Ureaplasma parvum biofilms *in vitro*
Rowlands, R. S., Kragh, Kasper Nørskov, Sahu, S., Maddocks, S. E., Bolhuis, A., Spiller, O. B. & Beeton, M. L., 2021, (Accepted/In press) In: Journal of Applied Microbiology.

Biofilms can act as plasmid reserves in the absence of plasmid specific selection
Røder, Henriette Lyng, Trivedi, Urvish, Russel, Jakob, Kragh, Kasper Nørskov, Herschend, J., Thalsø-Madsen, I., Tolker-Nielsen, Tim, Bjarnsholt, Thomas, Burmølle, Mette & Madsen, Jonas Stenløkke, 2021, In: NPJ biofilms and microbiomes. 7, 6 p., 78.

Effective antimicrobial combination in vivo treatment predicted with microcalorimetry screening
Kragh, Kasper Nørskov, Gijón, D., Maruri, A., Antonelli, A., Coppi, M., Kolpen, M., Crone, S., Tellapragada, C., Hasan, B., Radmer, S., de Vogel, C., van Wamel, W., Verbon, A., Giske, C. G., Rossolini, G. M., Cantón, R. & Frimodt-Møller, N., 2021, In: The Journal of antimicrobial chemotherapy. 76, 4, p. 1001-1009 9 p.

Induction of native c-di-GMP phosphodiesterases leads to dispersal of Pseudomonas aeruginosa biofilms
Andersen, Jens Bo, Kragh, Kasper Nørskov, Hultqvist, Louise Dahl, Rybtke, M., Nilsson, Carl Martin Peter, Jakobsen, Tim Holm, Givskov, Michael & Tolker-Nielsen, Tim, 2021, In: Antimicrobial Agents and Chemotherapy. 65, 4, e02431-20.

Peptidoglycan-Binding Anchor Is a *Pseudomonas aeruginosa* OmpA Family Lipoprotein With Importance for Outer Membrane Vesicles, Biofilms, and the Periplasmic Shape
Paulsson, M., Kragh, Kasper Nørskov, Su, Y. C., Sandblad, L., Singh, B., Bjarnsholt, Thomas & Riesbeck, K., 2021, In: Frontiers in Microbiology. 12, 639582.

Antibiotic susceptibility of cystic fibrosis lung microbiome members in a multispecies biofilm
Vandeplassche, E., Sass, A., Ostyn, L., Burmølle, Mette, Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Coenye, T. & Crabbé, A., 2020, In: Biofilm. 2, 9 p., 100031.

Biofilms of *mycobacterium abscessus* complex can be sensitized to antibiotics by disaggregation and oxygenation
Kolpen, M., Jensen, Peter Østrup, Qvist, T., Kragh, Kasper Nørskov, Ravnholt, C., Fritz, Blaine Gabriel, Johansen, U. R., Bjarnsholt, Thomas & Høiby, Niels, 2020, In: Antimicrobial Agents and Chemotherapy. 64, 2, e01212.

Eradication of biofilms on tympanostomy tubes with acetic acid treatment: an in vitro study
Kjeldsen, M., Homøe, Preben, Nielsen, Anne Kirstine, Crone, S., Kragh, Kasper Nørskov & Bjarnsholt, Thomas, 2020, In: APMIS. 128, 6, p. 445-450

In vivo demonstration of Pseudomonas aeruginosa biofilms as independent pharmacological microcompartments
Christophersen, L., Schwartz, F. A., Lerche, C. J., Svanekjær, T., Kragh, Kasper Nørskov, Laulund, A. S., Thomsen, Kim, Henneberg, K. Å., Sams, T., Høiby, Niels & Moser, Claus Ernst, 2020, In: Journal of Cystic Fibrosis. 19, 6, p. 996-1003

Pathological and microbiological impact of a gentamicin-loaded biocomposite following limited or extensive debridement in a porcine model of osteomyelitis
Blirup-Plum, Sophie Amalie, Bjarnsholt, Thomas, Jensen, Henrik Elvang, Kragh, Kasper Nørskov, Aalbæk, Bent, Gottlieb, Hans, Bue, M. & Jensen, Louise Kruse, 2020, In: Bone and Joint Research. 9, 7, p. 394-401 8 p.

The origin of extracellular DNA in bacterial biofilm infections *in vivo*
Alhede, M., Alhede, M., Qvortrup, K., Kragh, Kasper Nørskov, Jensen, Peter Østrup, Stewart, P. S. & Bjarnsholt, Thomas, 2020, In: Pathogens and Disease. ftaa018.

Extensive debridement is fundamental for the success of an absorbable gentamicin loaded bio-composite
Jensen, Louise Kruse, Blirup-Plum, Sophie Amalie, Aalbæk, Bent, Bjarnsholt, Thomas, Kragh, Kasper Nørskov, Gottlieb, H., Bue, M. & Jensen, Henrik Elvang, 12 Sep 2019.

Hyperbaric oxygen treatment increases killing of aggregating *Pseudomonas aeruginosa* isolates from cystic fibrosis patients
Møller, S. A., Jensen, Peter Østrup, Høiby, Niels, Ciofu, Oana, Kragh, Kasper Nørskov, Bjarnsholt, Thomas & Kolpen, M., 2019, In: Journal of Cystic Fibrosis. 18, 5, p. 657–664

In Situ Monitoring of the Antibacterial Activity of a Copper-Silver Alloy Using Confocal Laser Scanning Microscopy and pH Microsensors
Ciacotich, N., Kragh, Kasper Nørskov, Lichtenberg, Mads, Tesdorpf, J. E., Bjarnsholt, Thomas & Gram, L., 2019, In: Global Challenges. 3, 11, 9 p., 1900044.

In vivo gentamicin susceptibility test for prevention of bacterial biofilms in bone tissue and on implants
Jensen, Louise Kruse, Bjarnsholt, Thomas, Kragh, Kasper Nørskov, Aalbæk, Bent, Henriksen, Nicole Lind, Blirup-Plum, Sophie Amalie, Pankoke, Karen, Petersen, A. & Jensen, Henrik Elvang, 2019, In: Antimicrobial Agents and Chemotherapy. 63, 2, 10 p., e01889-18.

Into the well—A close look at the complex structures of a microtiter biofilm and the crystal violet assay
Kragh, Kasper Nørskov, Alhede, M., Kvich, L. & Bjarnsholt, Thomas, 2019, In: Biofilm. 1, 9 p., 100006.

Is pseudarthrosis after spinal instrumentation caused by a chronic infection?
Ohrt-Nissen, S., Fritz, Blaine Gabriel, Valentin, L., Kragh, Kasper Nørskov, Manniche, C., Dahl, B. & Bjarnsholt, Thomas, 2019, In: European Spine Journal. 28, p. 2996–3002

Oxygen restriction generates difficult-to-culture *p. Aeruginosa*
Kvich, L., Fritz, Blaine Gabriel, Crone, Stephanie Geisler, Kragh, Kasper Nørskov, Kolpen, M., Sønderholm, M., Andersson, M., Koch, Anders, Jensen, Peter Østrup & Bjarnsholt, Thomas, 2019, In: Frontiers in Microbiology. 10, AUG, 15 p., 1992.

Samspillet mellem mikrobiota og immunsystemet ved kolorektal cancer
Raskov, H., Bjarnsholt, Thomas, Alamili, M., Kragh, Kasper Nørskov & Gögenur, Ismail, 5 Nov 2018, In: Ugeskrift for Laeger. 180, 45, V04180253.

Bacterial biofilm formation inside colonic crypts may accelerate colorectal carcinogenesis
Raskov, H., Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Alamili, M. & Gögenur, Ismail, 17 Sep 2018, In: Clinical and Translational Medicine. 7, 4 p., 30.

Extreme high local intra-operative gentamicin concentrations are needed to prevent biofilm formation in-vivo
Jensen, Louise Kruse, Bjarnsholt, Thomas, Henriksen, Nicole Lind, Kragh, Kasper Nørskov & Jensen, Henrik Elvang, 6 Sep 2018.

Bacterial Aggregates Establish at the Edges of Acute Epidermal Wounds
Bay, Lene, Kragh, Kasper Nørskov, Eickhardt, S. R., Poulsen, Steen Seier, Gjerdrum, Lise Mette Rahbek, Ghathian, K., Calum, Henrik Pierre, Ågren, Magnus & Bjarnsholt, Thomas, Apr 2018, In: Advances in Wound Care. 7, 4, p. 105-113

Bacterial biofilms: a possible mechanism for chronic infection in patients with lumbar disc herniation - a prospective proof-of-concept study using fluorescence *in situ* hybridization
Ohrt-Nissen, S., Fritz, Blaine Gabriel, Walbom, J., Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Dahl, Benny & Manniche, C., 2018, In: APMIS : acta pathologica, microbiologica, et immunologica Scandinavica. 126, 5, p. 440-447 8 p.

Combined Staining Techniques for Demonstration of *Staphylococcus aureus* Biofilm in Routine Histopathology
Jensen, Louise Kruse, Henriksen, Nicole Lind, Bjarnsholt, Thomas, Kragh, Kasper Nørskov & Jensen, Henrik Elvang, 2018, In: Journal of Bone and Joint Infection. 3, 1, p. 27-36

Inoculation method could impact the outcome of microbiological experiments
Kragh, Kasper Nørskov, Alhede, M., Rybtke, M., Stavnsbjerg, Camilla, Tolker-Nielsen, Tim, Whiteley, M. & Bjarnsholt, Thomas, 2018, In: Applied and Environmental Microbiology. 84, 5, 14 p., e02264-17.

Tools for studying growth patterns and chemical dynamics of aggregated *Pseudomonas aeruginosa* exposed to different electron acceptors in an alginate bead model
Sønderholm, M., Koren, K., Wangpraseurt, D., Jensen, Peter Østrup, Kolpen, M., Kragh, Kasper Nørskov, Bjarnsholt, Thomas & Kühl, Michael, 2018, In: NPJ biofilms and microbiomes. 4, 11 p., 3.

UV light assisted antibiotics for eradication of *in vitro* biofilms
Argyraki, A., Markvart, Merete, Stavnsbjerg, Camilla, Kragh, Kasper Nørskov, Ou, Y., Bjørndal, Lars, Bjarnsholt, Thomas & Petersen, P. M., 2018, In: Scientific Reports. 8, p. 1-9 16360.

Hyperbaric oxygen sensitizes anoxic *Pseudomonas aeruginosa* biofilm to ciprofloxacin
Kolpen, M., Lerche, C. J., Kragh, Kasper Nørskov, Sams, T., Koren, K., Jensen, A. S., Line, L., Bjarnsholt, Thomas, Ciofu, Oana, Moser, Claus Ernst, Kühl, Michael, Høiby, Niels & Jensen, Peter Østrup, Nov 2017, In: Antimicrobial Agents and Chemotherapy. 61, 11, 9 p., e01024-17.

O-2 AFFECTS THE ACTIVITY OF AMIKACIN ON MYCOBACTERIUM ABSCESSUS BIOFILM
Kolpen, M., Ravnholt, C., Qvist, T., Kragh, Kasper Nørskov, Fritz, Blaine Gabriel, Bjarnsholt, Thomas, Høiby, Niels & Jensen, Peter Østrup, Sep 2017, In: Pediatric Pulmonology. 52, S47, p. S359-S360 379.

***Pseudomonas aeruginosa* aggregate formation in an alginate bead model system exhibits *In Vivo*-like characteristics**
Sønderholm, M., Kragh, Kasper Nørskov, Koren, K., Jakobsen, Tim Holm, Darch, S., Alhede, M., Jensen, Peter Østrup, Whiteley, M., Kühl, Michael & Bjarnsholt, Thomas, May 2017, In: Applied and Environmental Microbiology. 83, 9, 15 p., e00113-17.

Phage inhibit pathogen dissemination by targeting bacterial migrants in a chronic infection model
Darch, S. E., Kragh, Kasper Nørskov, Abbott, E. A., Bjarnsholt, Thomas, Bull, J. J. & Whiteley, M., Mar 2017, In: mBio. 8, 2, 15 p., e00240-17.

Phenotypic shift in Pseudomonas aeruginosa populations from cystic fibrosis lungs after 2-week antipseudomonal treatment
Fernandez-Barat, L., Ciofu, Oana, Kragh, Kasper Nørskov, Pressler, T., Johansen, U., Motos, A., Torres, A. & Høiby, Niels, Mar 2017, In: Journal of Cystic Fibrosis. 16, 2, p. 222-229

Real-Time Monitoring of nfxB Mutant Occurrence and Dynamics in Pseudomonas aeruginosa Biofilm Exposed to Subinhibitory Concentrations of Ciprofloxacin
Zaborskytė, G., Andersen, Jens Bo, Kragh, Kasper Nørskov & Ciofu, Oana, Mar 2017, In: Antimicrobial Agents and Chemotherapy. 61, 3, 14 p., e02292-16.

Early implant-associated osteomyelitis results in a peri-implanted bacterial reservoir
Jensen, Louise Kruse, Koch, J., Aalbæk, Bent, Moodley, Arshnee, Bjarnsholt, Thomas, Kragh, Kasper Nørskov, Petersen, A. & Jensen, Henrik Elvang, Jan 2017, In: APMIS - Journal of Pathology, Microbiology and Immunology. 125, 1 , p. 38-45 8 p.

Microenvironmental characteristics and physiology of biofilms in chronic infections of CF patients are strongly affected by the host immune response
Jensen, Peter Østrup, Kolpen, M., Kragh, Kasper Nørskov & Kühl, Michael, 2017, In: A P M I S. Acta Pathologica, Microbiologica et Immunologica Scandinavica. 125, 4, p. 276–288 13 p.

Novel porcine model of implant-associated osteomyelitis: A comprehensive analysis of local, regional, and systemic response
Jensen, Louise Kruse, Koch, J., Dich-Jørgensen, K., Aalbæk, Bent, Petersen, A., Fuursted, K., Bjarnsholt, Thomas, Kragh, Kasper Nørskov, Tøtterup, M., Bue, M., Hanberg, P., Søballe, K., Heegaard, P. M. H. & Jensen, Henrik Elvang, 2017, In: Journal of Orthopaedic Research. 35, 10, p. 2211–2221

The Pseudomonas aeruginosa PSL polysaccharide is a social but noncheatable trait in biofilms
Irie, Y., Roberts, A. E. L., Kragh, Kasper Nørskov, Gordon, V. D., Hutchison, J., Allen, R. J., Melaugh, G., Bjarnsholt, Thomas, West, S. A. & Diggle, S. P., 2017, In: mBio. 8, 3, 13 p., e00374-17.

The consequences of being in an infectious biofilm – microenvironmental conditions governing antibiotic tolerance
Sønderholm, M., Bjarnsholt, Thomas, Alhede, M., Kolpen, M., Jensen, Peter Østrup, Kühl, Michael & Kragh, Kasper Nørskov, 2017, In: International Journal of Molecular Sciences. 18, 12, 14 p., 2688.

Role of multicellular aggregates in biofilm formation
Kragh, Kasper Nørskov, Hutchison, J. B., Melaugh, G., Rodesney, C., Roberts, A. E. L., Irie, Y., Jensen, Peter Østrup, Diggle, S. P., Allen, R. J., Gordon, V. & Bjarnsholt, Thomas, 22 Mar 2016, In: mBio. 7, 2, 11 p., e00237-16.

Shaping the growth behaviour of biofilms initiated from bacterial aggregates
Melaugh, G., Hutchison, J., Kragh, Kasper Nørskov, Irie, Y., Roberts, A., Bjarnsholt, Thomas, Diggle, S. P., Gordon, V. D. & Allen, R. J., 2 Mar 2016, In: P L o S One. 11, 3, 18 p., e0149683.

Increased bactericidal activity of colistin on *Pseudomonas aeruginosa* biofilms in anaerobic conditions
Kolpen, M., Appeldorff, C. F., Brandt, S., Mousavi, N., Kragh, Kasper Nørskov, Aydogan, S., Uppal, H. A., Bjarnsholt, Thomas, Ciofu, Oana, Høiby, Niels & Jensen, Peter Østrup, Feb 2016, In: Pathogens and Disease. 74, 1, 7 p., ftv086.

Chronic pulmonary disease with *Mycobacterium abscessus* complex is a biofilm infection
Qvist, T., Eickhardt-Dalbøge, S. R., Kragh, Kasper Nørskov, Andersen, C. B., Iversen, M., Høiby, Niels & Bjarnsholt, Thomas, Dec 2015, In: European Respiratory Journal. 46, 6, p. 1823-1826 4 p.

The Limitations of *In Vitro* Experimentation in Understanding Biofilms and Chronic Infection
Roberts, A. E. L., Kragh, Kasper Nørskov, Bjarnsholt, Thomas & Diggle, S. P., 20 Nov 2015, In: Journal of Molecular Biology. 427, 23, p. 3646-3661 16 p.

RE-SENSITIZATION OF ANOXIC *PSEUDOMONAS AERUGINOSA* BIOFILMS WITH RE-OXYGENATION USING HYPERBARIC OXYGEN TREATMENT
Kolpen, M., Mousavi, N., Sams, T., Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Ciofu, Oana, Høiby, Niels & Jensen, P. O., Oct 2015, In: Pediatric Pulmonology. 50, S41, p. 312-312 1 p., 322.

The Density of Competitors in a Stratified Environment Determines the Relative Fitness of Biofilm Structures
Gordon, V. D., Kragh, Kasper Nørskov, Hutchison, J. B., Melaugh, G., Rodesney, C. A., Irie, Y., Diggle, S., Allen, R. J. & Bjarnsholt, Thomas, 9 Feb 2015, In: Biophysical Journal. 108, 2, supplement 1, p. 313A-313A 1 p., 1568-Pos.

Autofluorescence in samples obtained from chronic biofilm infections – "all that glitters is not gold"
Eickhardt-Dalbøge, S. R., Kragh, Kasper Nørskov, Schrøder, S., Poulsen, Steen Seier, Sillesen, Henrik, Givskov, Michael , Høiby, Niels, Bjarnsholt, Thomas & Alhede, M., 2015, In: Pathogens and Disease. 73, 4, 4 p., ftv012.

Denitrification by cystic fibrosis pathogens - *Stenotrophomonas maltophilia* is dormant in sputum
Kolpen, M., Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Line, L., Hansen, C. R., Dalbøge, C. S., Hansen, N., Kühl, Michael, Høiby, Niels & Jensen, Peter Østrup, 2015, In: International Journal of Medical Microbiology. 305, 1, p. 1-10 10 p.

Bacterial biofilm formation and treatment in soft tissue fillers
Alhede, M., Er, O., Eickhardt, S., Kragh, Kasper Nørskov, Alhede, M., Hultqvist, Louise Dahl, Poulsen, Steen Seier, Givskov, Michael, Christensen, L. H., Høiby, Niels, Tvede, M. & Bjarnsholt, Thomas, 30 Jan 2014, In: Pathogens and Disease. 70, p. 339-346 8 p.

Formation of hydroxyl radicals contributes to the bactericidal activity of ciprofloxacin against *Pseudomonas aeruginosa* biofilms
Jensen, Peter Østrup, Briales, A., Brochmann, R. P., Wang, H., Kragh, Kasper Nørskov, Kolpen, M., Hempel, C., Bjarnsholt, Thomas, Høiby, Niels & Ciofu, Oana, 2014, In: Pathogens and Disease. 70, 3, p. 440-443 4 p.

Polymorphonuclear leukocytes restrict growth of *Pseudomonas aeruginosa* in the lungs of cystic fibrosis patients
Kragh, Kasper Nørskov, Alhede, M., Jensen, Peter Østrup, Moser, Claus Ernst, Scheike, Thomas, Jacobsen, C. S., Poulsen, Steen Seier, Eickhardt-Sørensen, S. R., Trostrup, H., Christoffersen, L., Hougen, Hans Petter, Rickelt, L. F., Kühl, Michael, Høiby, Niels & Bjarnsholt, Thomas, 2014, In: Infection and Immunity. 82, 11, p. 4477-4486 10 p.

Rapid identification of *Stenotrophomonas maltophilia* by peptide nucleic acid fluorescence *in situ* hybridization
Knudsen, N. R., Rasmussen, A. K. I., Fiandaca, M. J., Kragh, Kasper Nørskov, Bjarnsholt, Thomas, Høiby, Niels, Stender, H. & Guardabassi, Luca, 2014, In: New Microbes and New Infections. 2, 3, p. 79-81 3 p.

The microorganisms in chronically infected end-stage and non-end-stage cystic fibrosis patients
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True microbiota involved in chronic lung infection of cystic fibrosis patients found by culturing and 16S rRNA gene analysis
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