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15-19 April, 2024
Organize:
European Society of Nematologists

The Biochemical Diversity of the Second-stage Juvenile Surface Coat: its Origin, Role and Interaction with *Pasteuria* Endospores

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2. Division of Nematology, Indian Agricultural Research Institute, India
3. College of Agriculture, West Bengal, India
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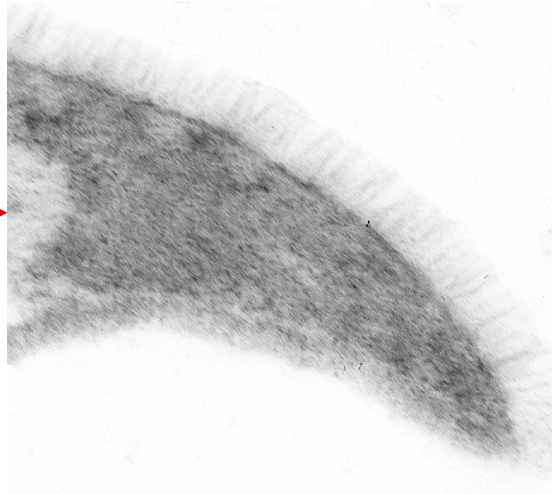
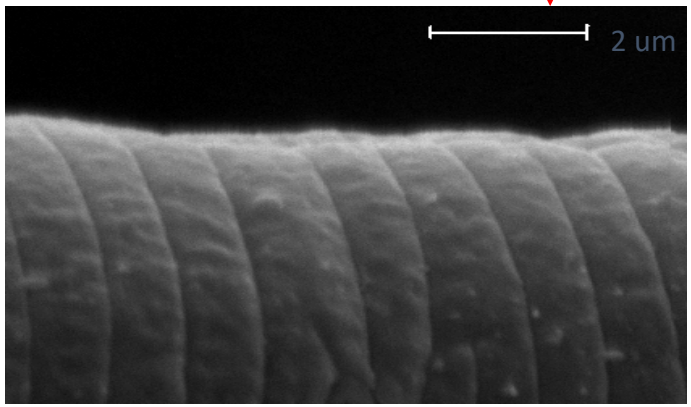
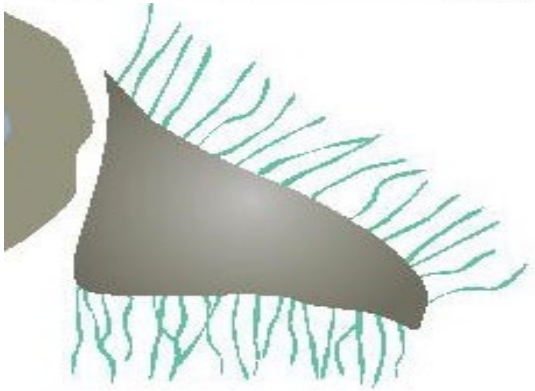
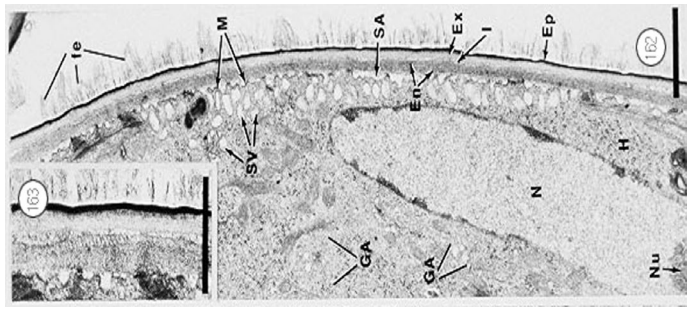
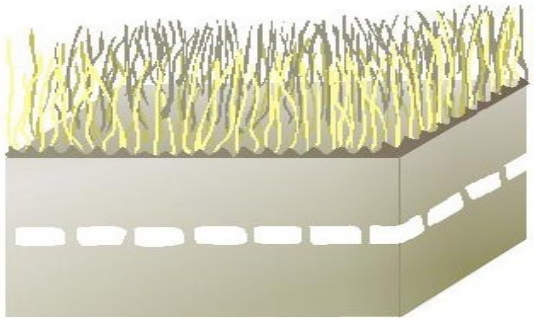
Spore attachment: *Velcro*-like mechanism











Davies, 2009, *Advances in Parasitology* 68, 211-245

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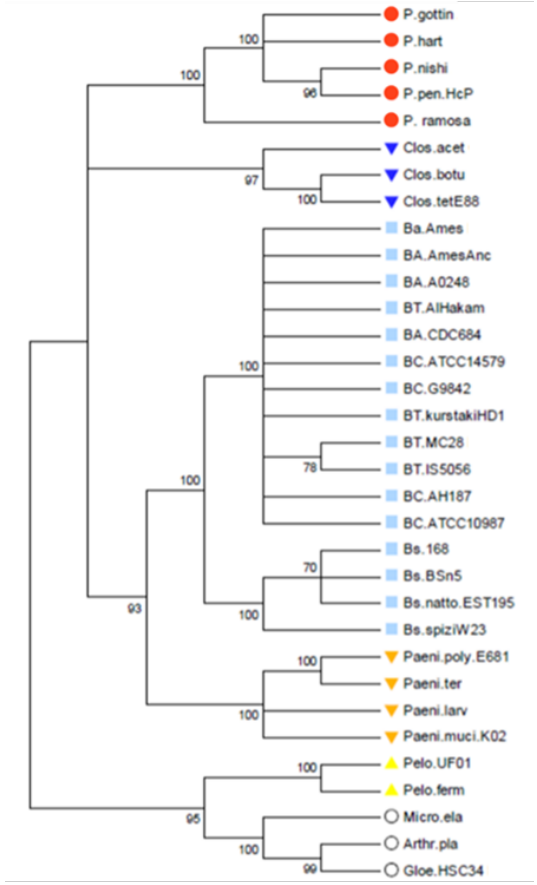
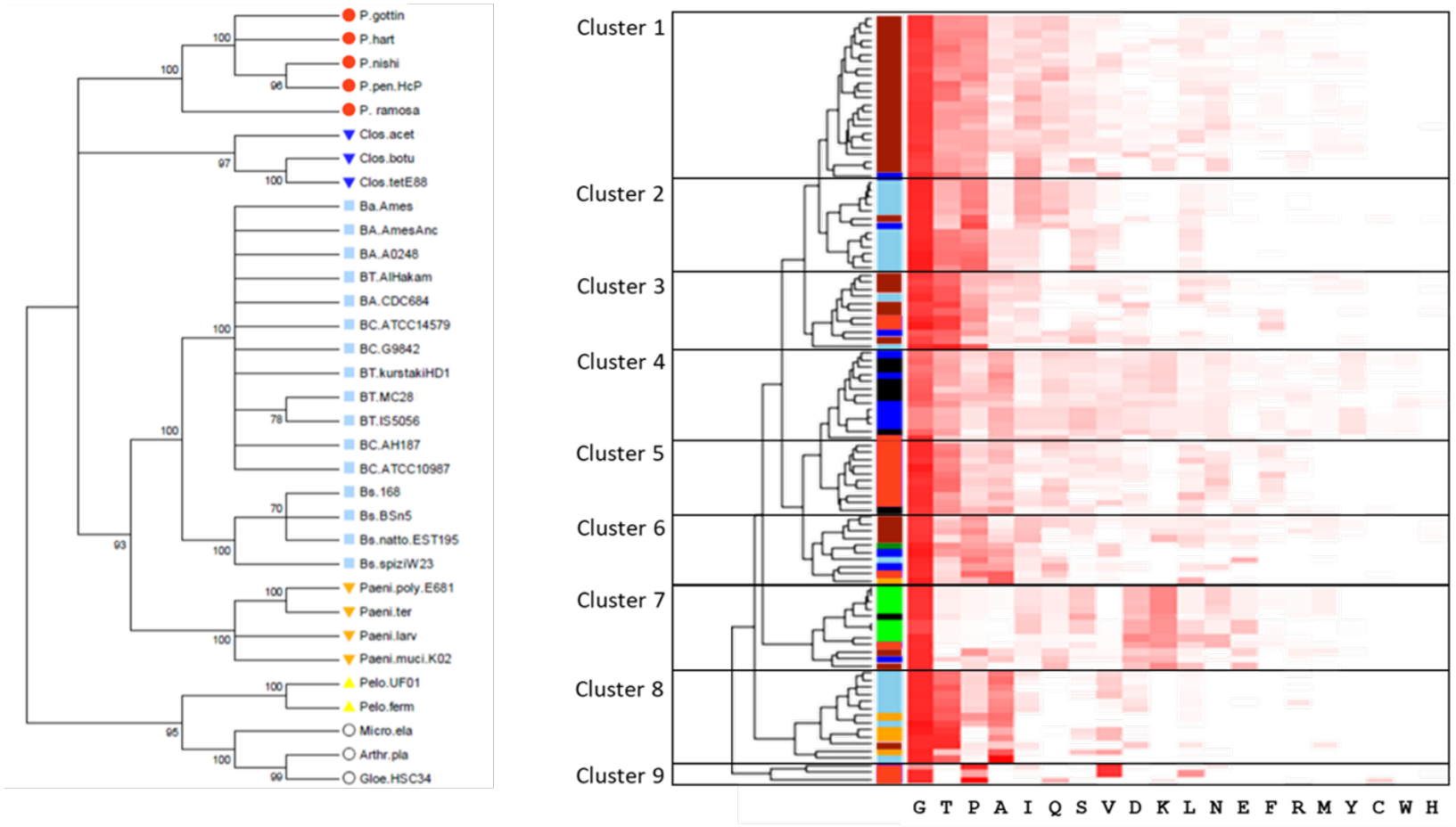
Phylogenetic tree based on 16 sRNA sequences



(a)

Srivastava *et* al., *Fems Microbiology Ecology* (2019) 95. doi: 10.1093/femsec/fiy217.

Phylogenetic tree based on 16 sRNA sequences compared to similar tree based on collagen-like sequences



(a) (b)

Srivastava *et* al., *Fems Microbiology Ecology* (2019) 95. doi: 10.1093/femsec/fiy217.

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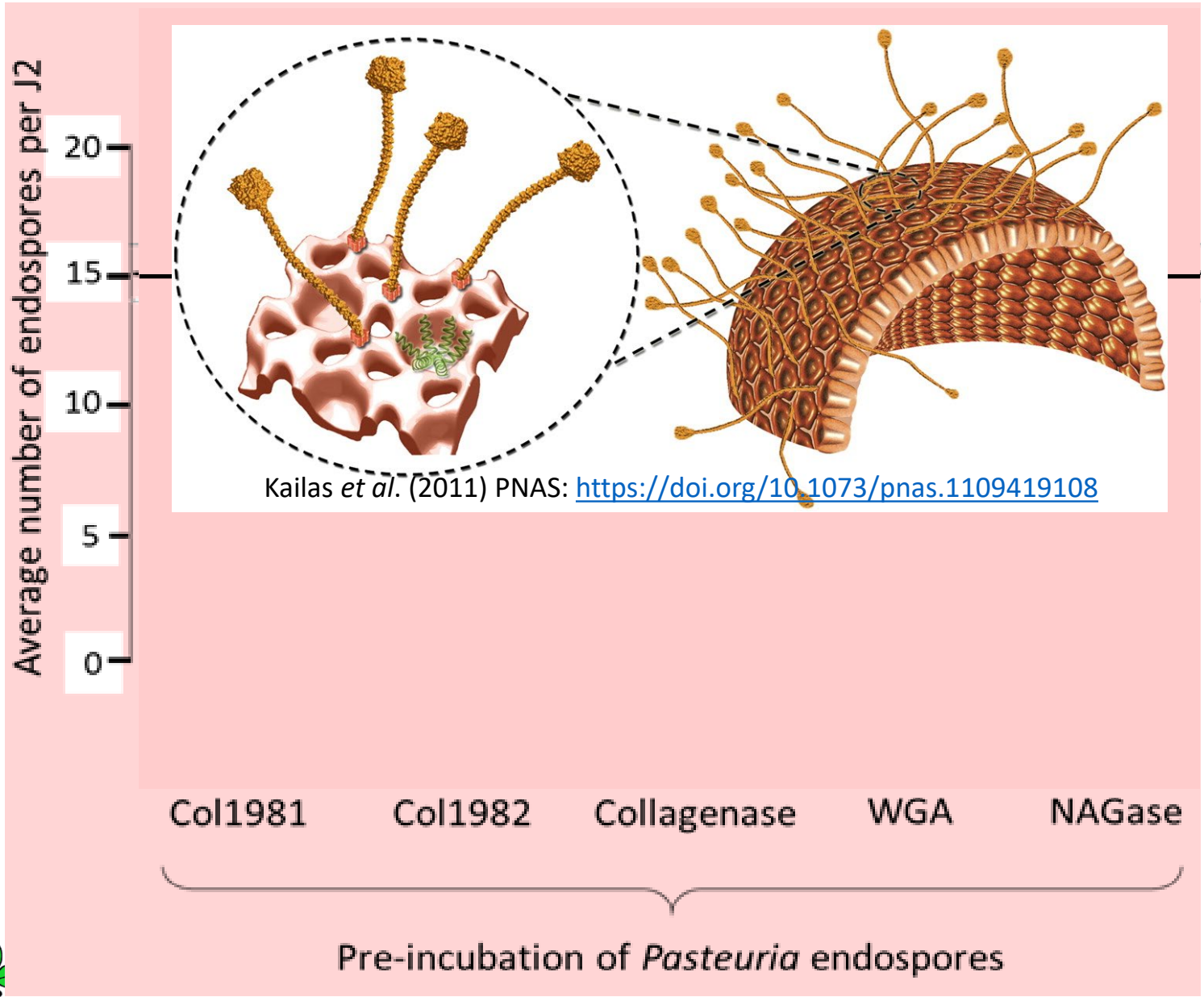

Kailas *et al*. (2011) PNAS: https://doi.org/10.1073/pnas.1109419108

Srivastava *et al* (2022) *J. Appl. Microbiol*. 132, 4371–4387. doi: 10.1111/jam.15522

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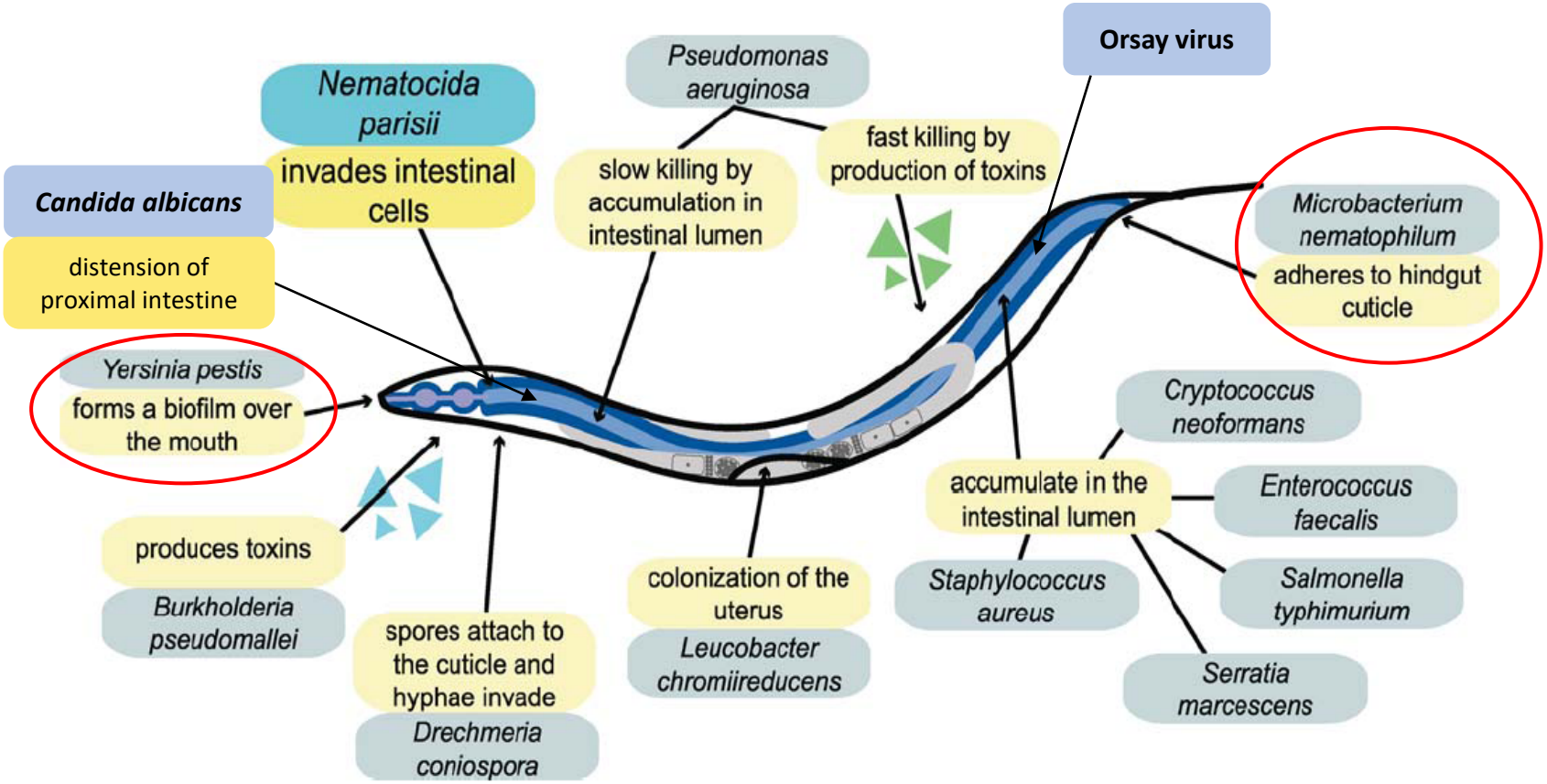
Natural and human modelled pathogens of *C. elegans*



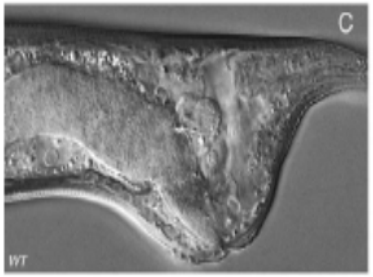
doi:10.1371/journal.pbio.1000005.g001

Figure 1. *C. elegans* and Its Enemies
Diagram of *C. elegans* anatomy, indicating some of the pathogens under laboratory investigation and their modes of attack on the worm.

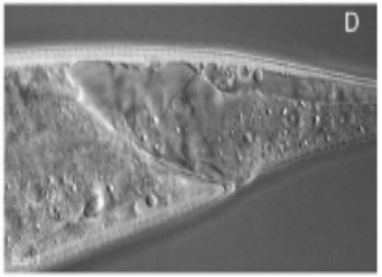
Adapted from Hodgkin and Partridge (2008) *PLOS Biology* 6, 2634-2637

Microbacterium nematophilum

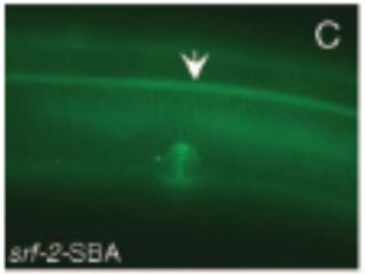
Wild type



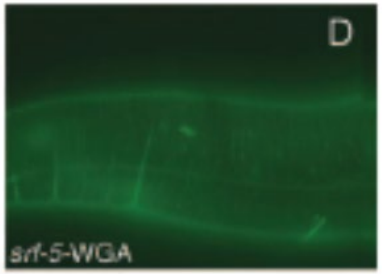
bus mutant



srf-2 mutant



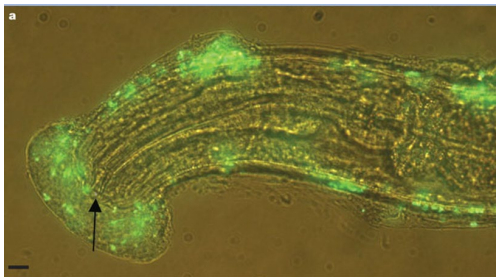
srf-5 mutant



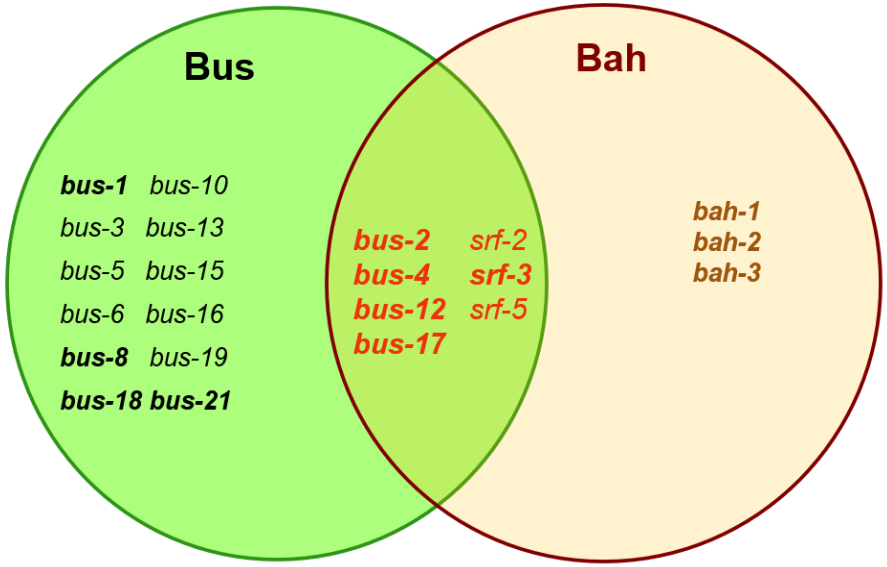
Mutations in genes conferring resistance to *M. nematophilum* affect surface antigenicity

Maria Gravato-Nobre *et al*. 2005, Genetics 171, 1033-1045

Yersinia pestis



Overlap between mutants with impaired bacterial adhesion



Bus Bacterially Un-Swollen (*M. nem.* resistant)
Bah Biofilm Absent on Head (*Yersinia* resistant)

(Darby *et al.* (2007) *Genetics* 176: 221-230)

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G3, 2023, 13(5), jkad056
https://doi.org/10.1093/g3journal/jkad056
Advance Access Publication Date: 13 March 2023
Investigation

Isolation and molecular identification of nematode surface mutants with resistance to bacterial pathogens

Delia O'Rourke,[1] Maria J. Gravato-Nobre,[1] Dave Stroud,[1] Emily Pritchett,[1] Emily Barker,[1] Rebecca L. Price,[1] Sarah A. Robinson,[1] Simon Spiro,[1] Patricia Kuwabara,[2] Jonathan Hodgkin[1,*]

[1]Department of Biochemistry, University of Oxford, Oxford OX1 3QU, UK
[2]School of Biochemistry, University of Bristol, Bristol BS8 1TD, UK

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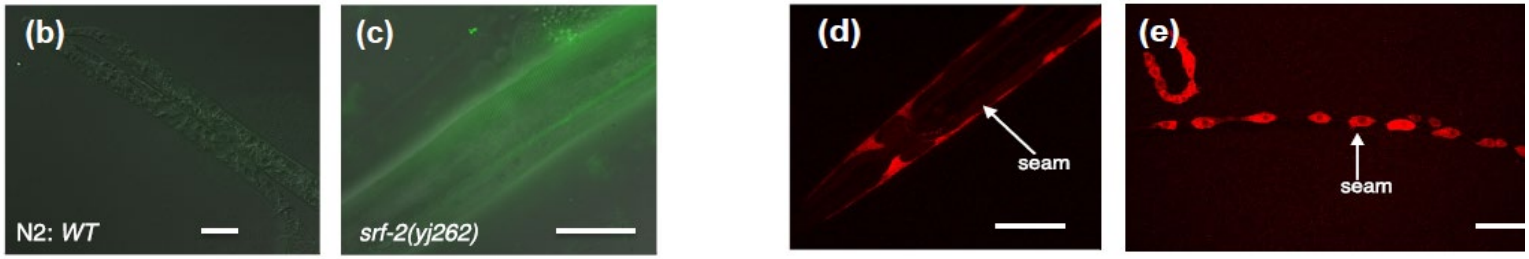
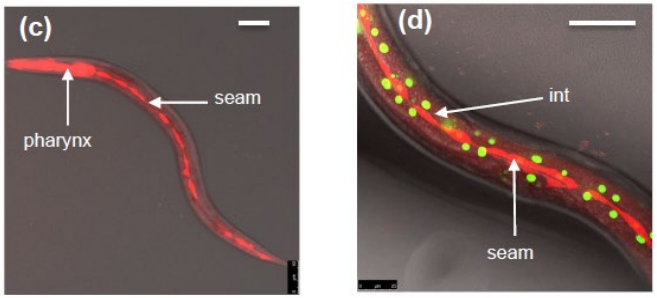
srf-2 mutant



Lectin WGA
binding to *srf*-2 cuticle



srf-5 mutant

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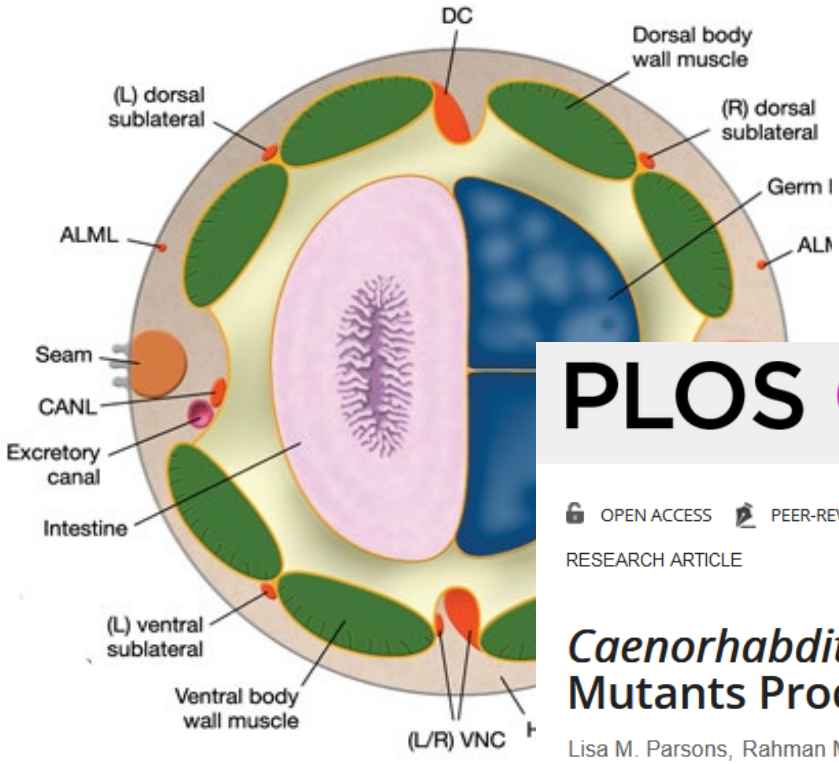
G3 Genes | Genomes | Genetics

Isolation and molecular identifica
mutants with resistance to bacte



Caenorhabditis
cross-sect

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Table 3. Molecular identities.

Gene name	Cosmid name	Biochemical features	Comment/ reference
srf-2	F59C6.8	Glycosyl transferase GT92	This paper
srf-3	M02B1.1	UDP sugar transporter	Ref. 1
srf-5	F54B11.10	Small secreted protein	This paper
bus-1	R03H4.6	Acyl transferase	Ref. 3
bus-2	K08D12.5	Glycosyl transferase	Ref. 5
bus-4	T22B11.2	Glycosyl transferase	Ref. 5
bus-5	F53B1.4	TDP sugar dehydratase	This paper
bus-6	F52E1.9	PIP phosphatase	This paper
bus-8	T23F2.1	ALG2 mannosyltransferase	Ref. 4
bus-10	ZK596.3	Membrane protein	This paper
bus-12	JC8.12	UDP sugar transporter	Ref. 5
bus-13	T07H8.6	PTR receptor family	*ptr-15*; this paper
bus-17	ZK678.8	Glycosyl transferase	Ref. 2

PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

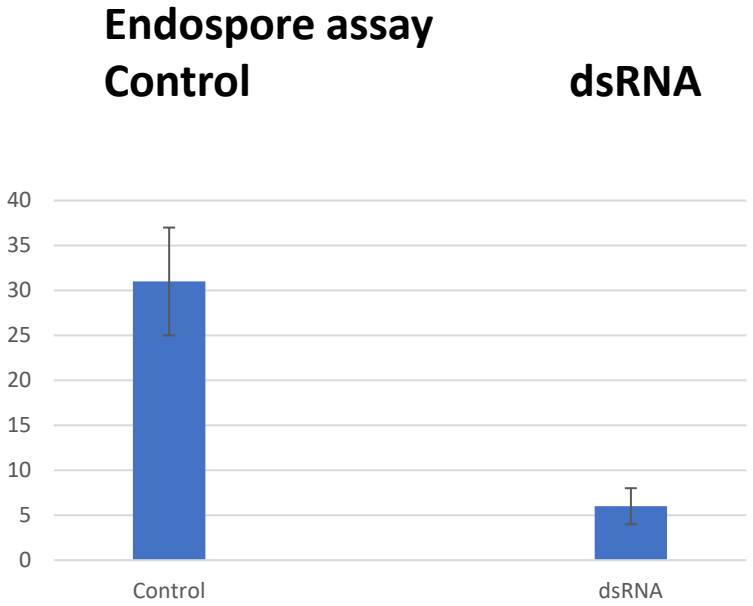
Caenorhabditis elegans Bacterial Pathogen Resistant *bus-4* Mutants Produce Altered Mucins

Lisa M. Parsons, Rahman M. Mizanur, Ewa Jankowska, Jonathan Hodgkin, Delia O'Rourke, Dave Stroud, Salil Ghosh, John F. Cipollo

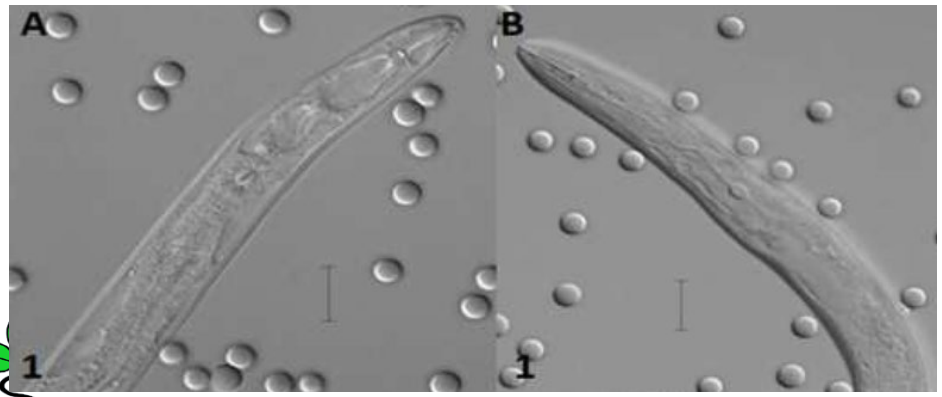
Published: October 8, 2014 • https://doi.org/10.1371/journal.pone.0107250

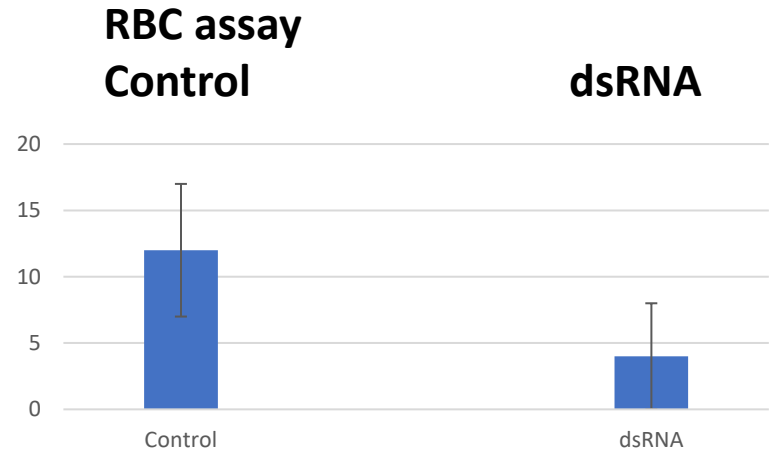
Article | Authors | Metrics | Comments | Media Coverage

Mucin knockdown & *Pasteuria* endospore assay

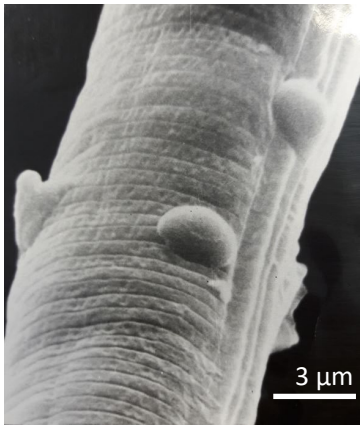


Red blood cell assay

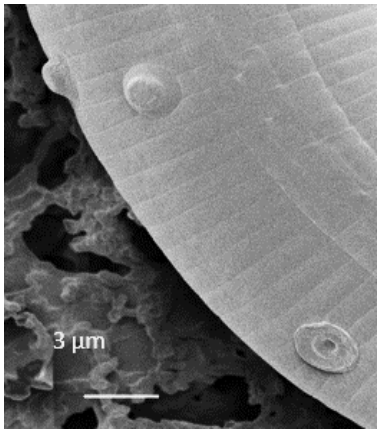




Victor Phani *et al.*, *Molecular Plant Pathology* https://doi.org/10.1111/mpp.12704

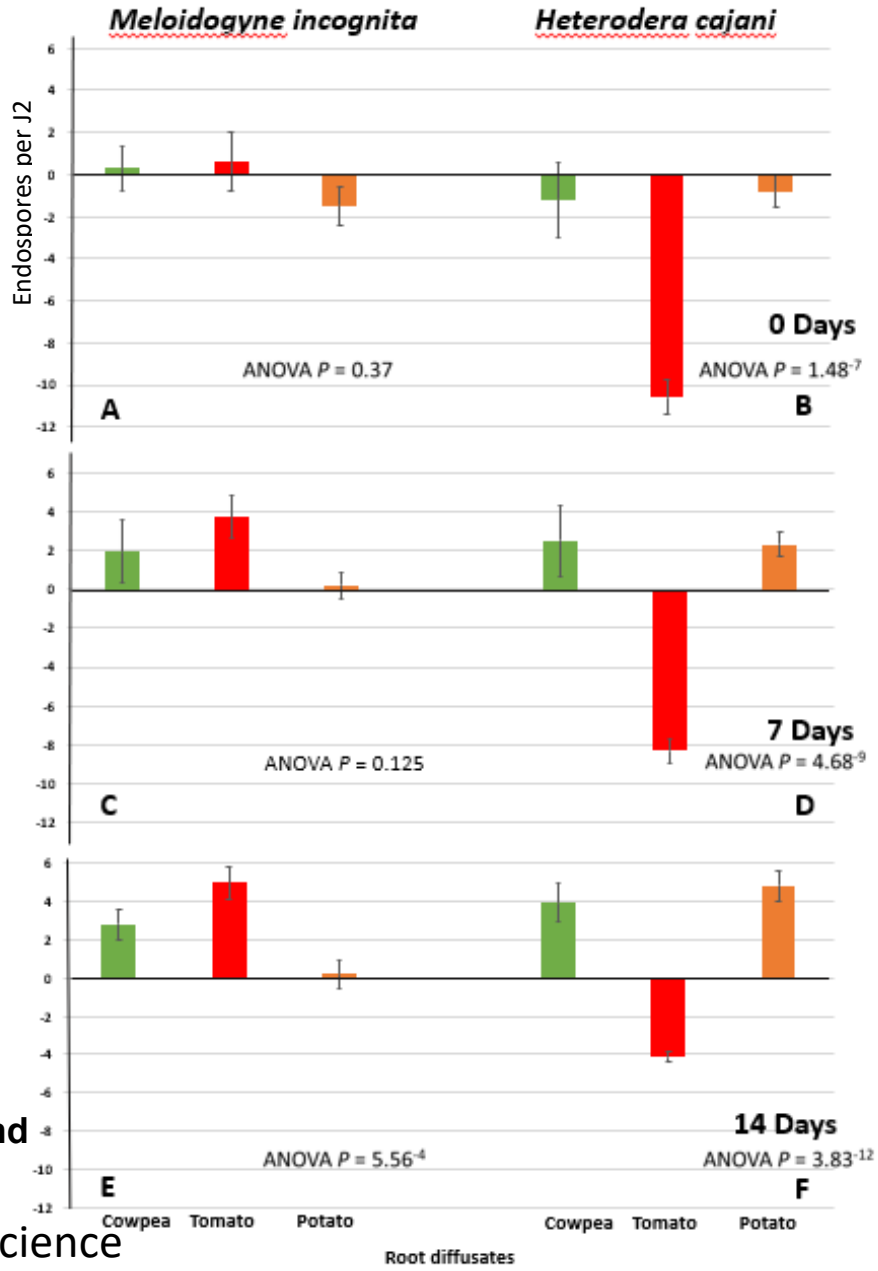


M. incognita (RKN)



H. cajani (HCN)

Cowpea Tomato Potato



Characterization of root exudates of cowpea, tomato and

Mohan *et al.,* (2020) Frontiers Plant Science
https://doi.org/10.3389/fpls.2020.00763

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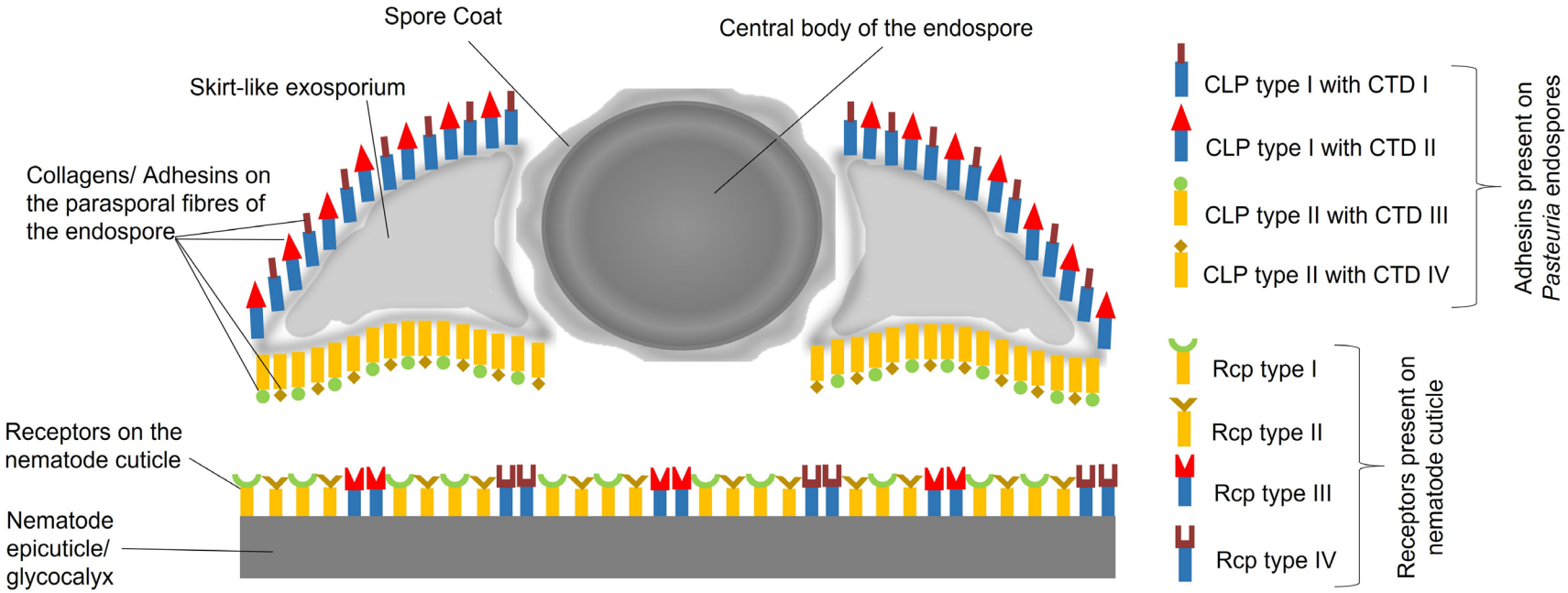
Exploring the mechanisms of host-specificity of a hyperparasitic bacterium (*Pasteuria* spp.) with potential to control tropical root-knot nematodes (*Meloidogyne* spp.): insights from *Caenorhabditis elegans*

Keith G. Davies[1*] Sharad Mohan[2†] Victor Phani[3] Arohi Srivastava[4]

Davies, Mohan, Phani & Srivastava (2023)
Front. Cell. and Infection Microbio.
https://doi.org/10.3389/fcimb.2023.1296293)



Different *Pasteuria* adhesin types recognize unique receptors present on the nematode cuticle via a 'lock-and-key type' of mechanism

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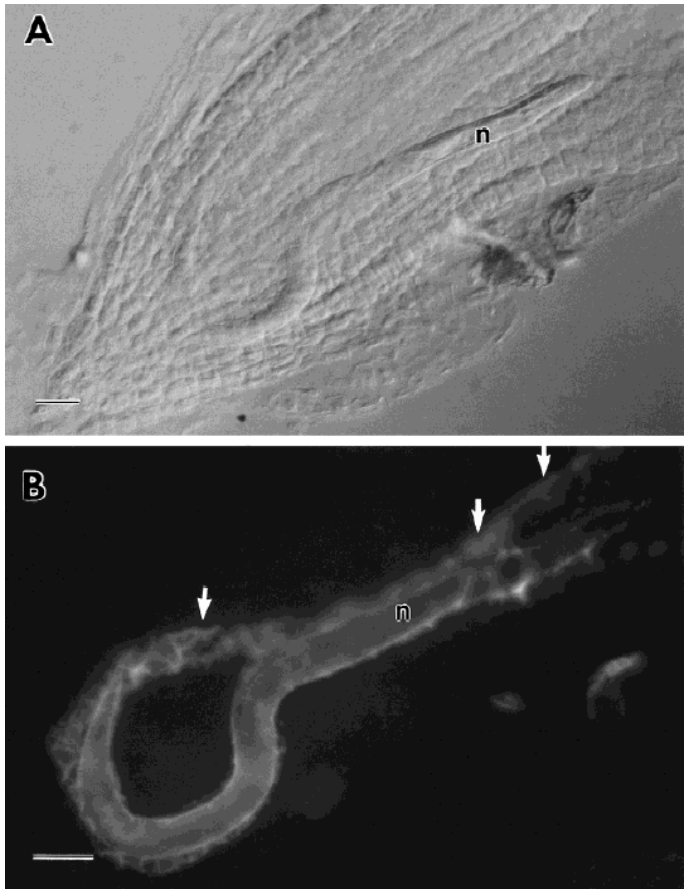
Journal of Nematology 31(2):212–223. 1999.

Meloidogyne incognita Surface Antigen Epitopes in Infected *Arabidopsis* Roots[1]

M. J. Gravato-Nobre,[2] M. A. McClure,[3] L. Dolan,[4] G. Calder,[4] K. G. Davies,[2] B. Mulligan,[5] K. Evans,[2] and N. von Mende[2]



Question:

Are the surface coat molecules that are responsible for the attachment of *Pasteuria* endospores also plant effectors and also being seen by the plant?

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Delia O'Rouke
Freddie Partridge
Dave Stroud

Indian Agric. Res. Inst.
Victor Phani
Uma Rao

Indian Council Agric. Res.
Arohi Srivastava