Bronchiectasis

The team

Medical staff

Dr Adam Hill

Vacant post- Dr Lithgow

Dr Ruzanna Frangulyan

Specialist Trainee

Specialist staff

Kim Turnbull

Denise

Gillian

Jenny Scott

Jo Pentland

Research nurses

Sam Donaldson

Andrea Clarke

Researchers

Dr Pallavi Bedi

Dr Manjit Cartlidge

Yang Zhang

Khatarina Singh Kang

Elena Perez Fernandez

Cathy Doherty

Prof John Govan

Dr Thamarai Schneiders

Prof Adriano Rossi

Dr Donald Davidson

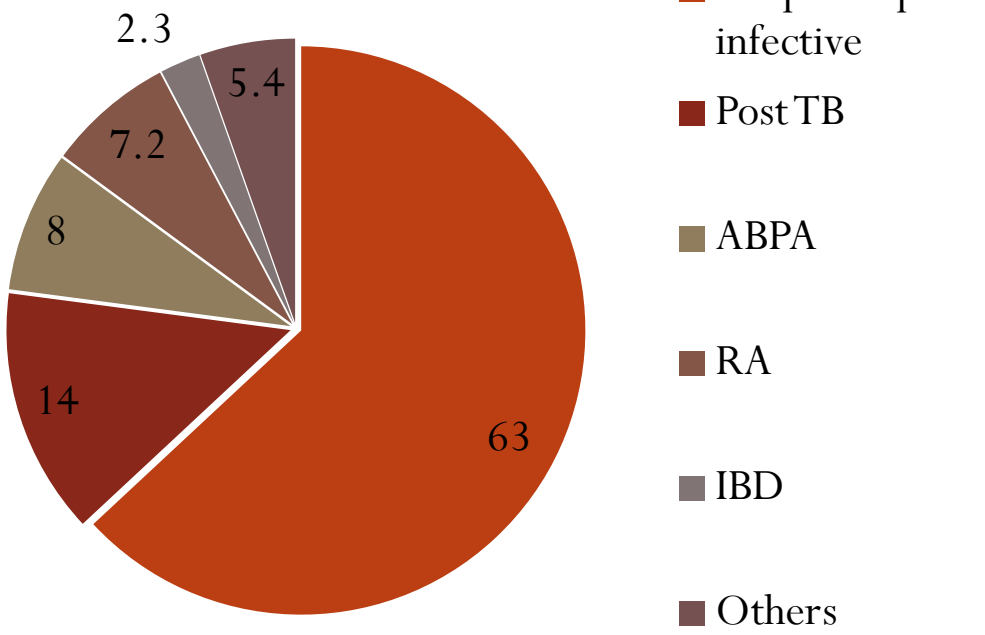
Dr Kev Dhaliwal

Local Developments

- Launch of website www.bronchiectasis.scot.nhs.uk
- Support for patients at Mon clinic
- Breathtakers Action for Bronchiectasis meetings

Bronchiectasis Severity Index

- Aim was to identify independent predictors of hospitalization and mortality over 4-year follow-up using clinical endpoints
- External validation
- Prospective study 2008-2012



5 European Centres

- Dundee
- Edinburgh
- Leuven
- Milan
- Newcastle

Total study population 1310

Am J Respir Crit Care Med. 2014 Mar 1;189(5):576-85.

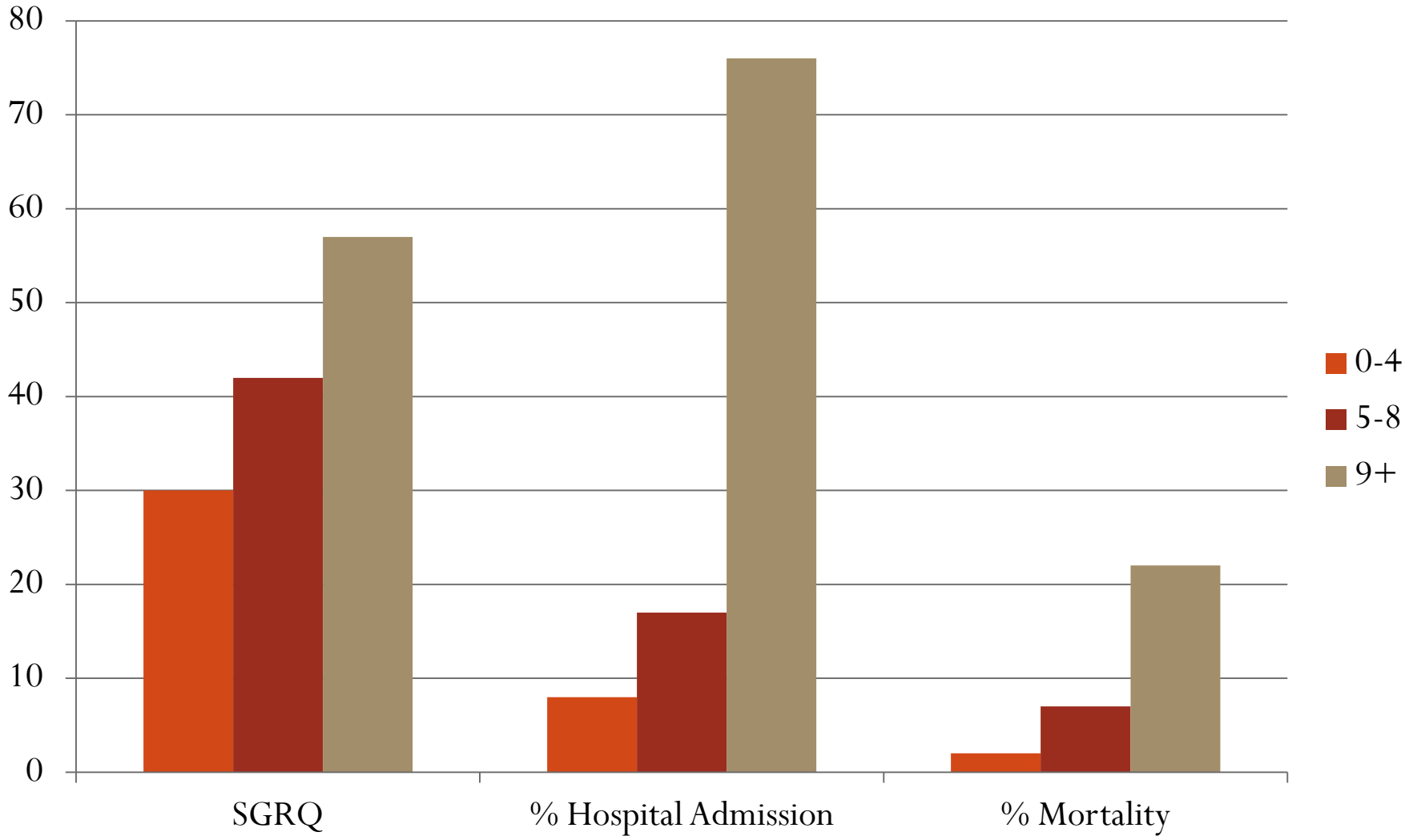
BSI Score points 0-25

	Score Points
Age	50-69 2; 70-79 4; 80+ 6
BMI <18.5 Kg/m^2	2
FEV_1 % Predicted	50-80 1; 30-49 2; <30 3
Previous hosp. admission	5
Exacs. Before study ≥3	2
MRC Score	4= 2; 5=3
Pseudomonas aeruginosa	3
Other PPMs	1
≥3 Lobes or cystic Bx	1

0-4; 5-8; 9+

www.bronchiectasisseverity.com

BSI and Outcome



Research Fellows update

- Dr Manjit Cartlidge

- Finished 2 year project funded by CHSS

- Studied stable patients and when they had an infection

Does the bacteria change during an infection?

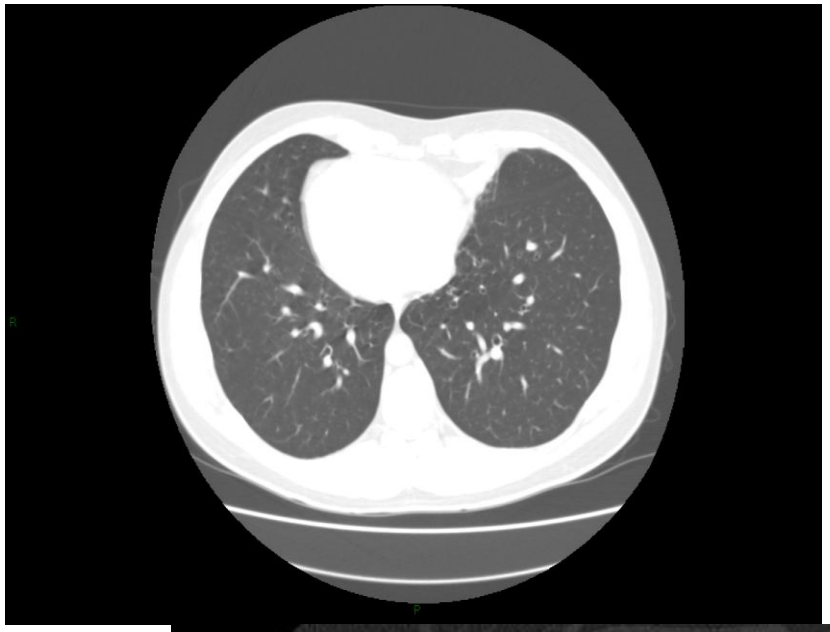
- Studied the use of the incremental walking test

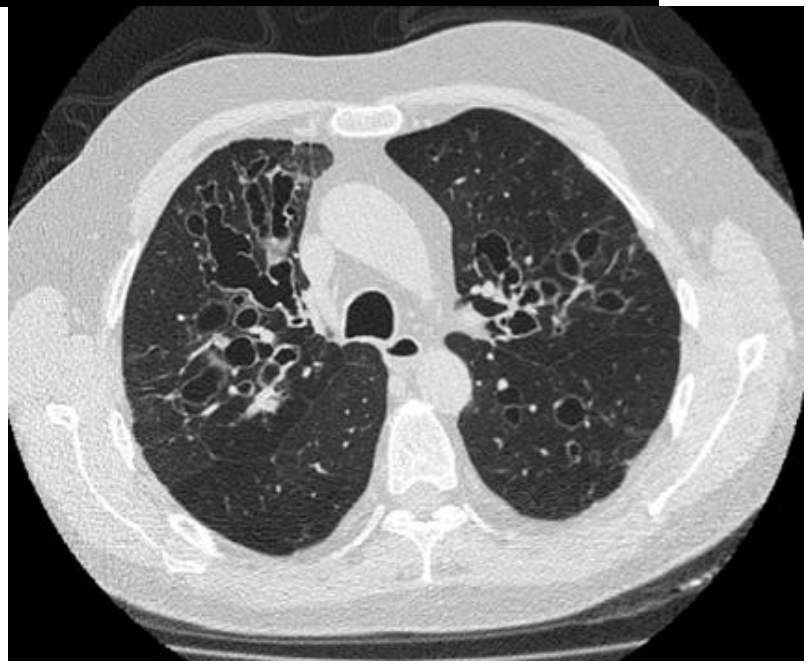
- Manjit is analysing the data and will present findings hopefully at the next meeting!

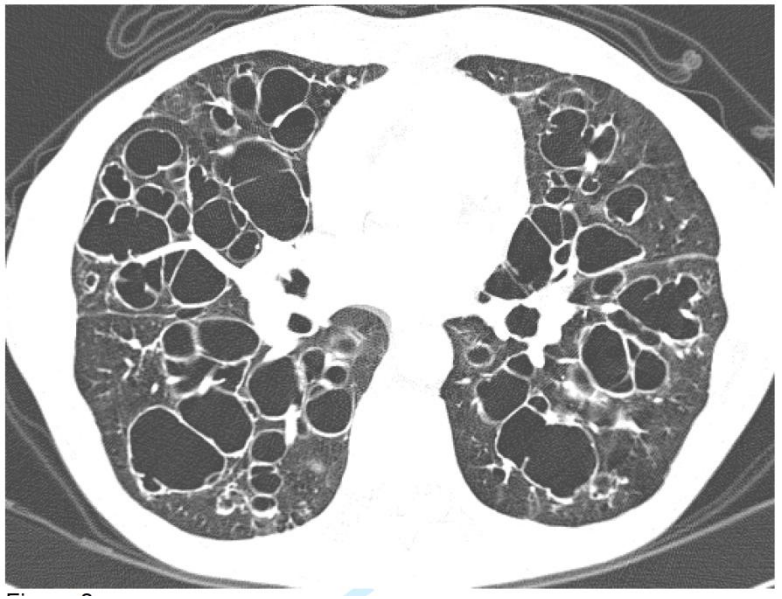
Research Fellows update

- Dr Pallavi Bedi
- Completing 3 year PhD project funded by CSO
- Studying whether there is deficiency of natural lipids are associated with bronchiectasis and a potential new non antibiotic treatment
- Look forward to seeing the results but preliminary data looks exciting

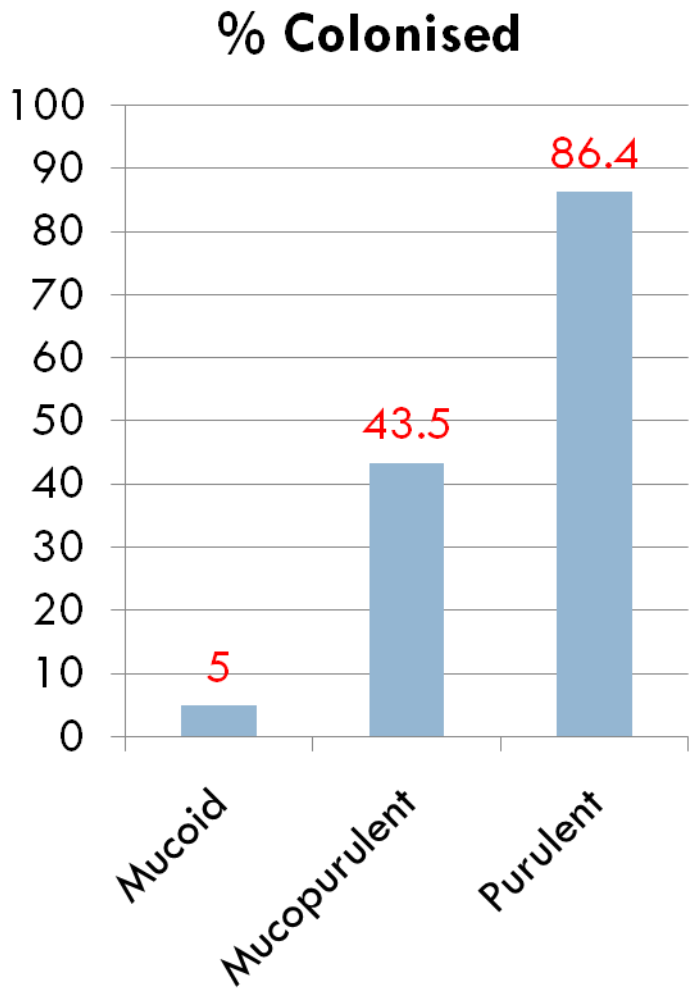
No Validated CT Scoring Systems in Bronchiectasis







Sputum purulence



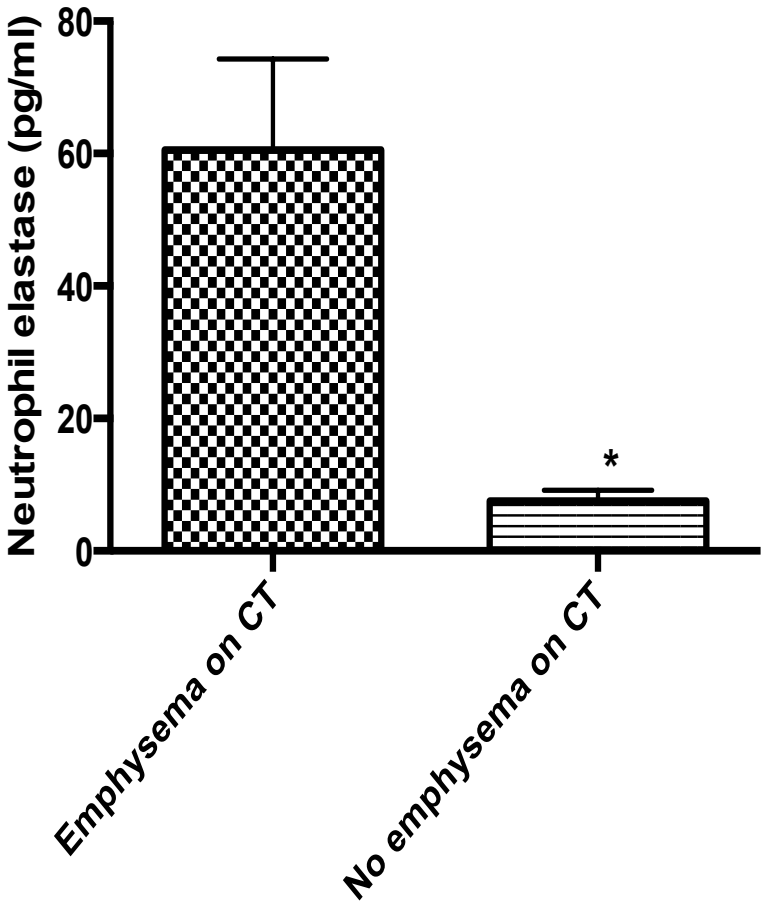
N=141

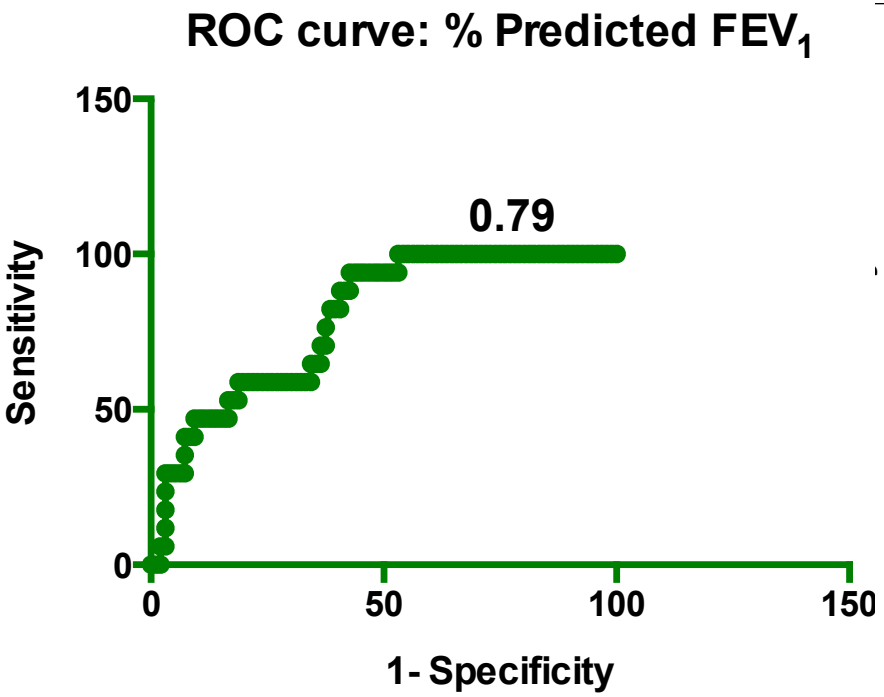
% Colonised

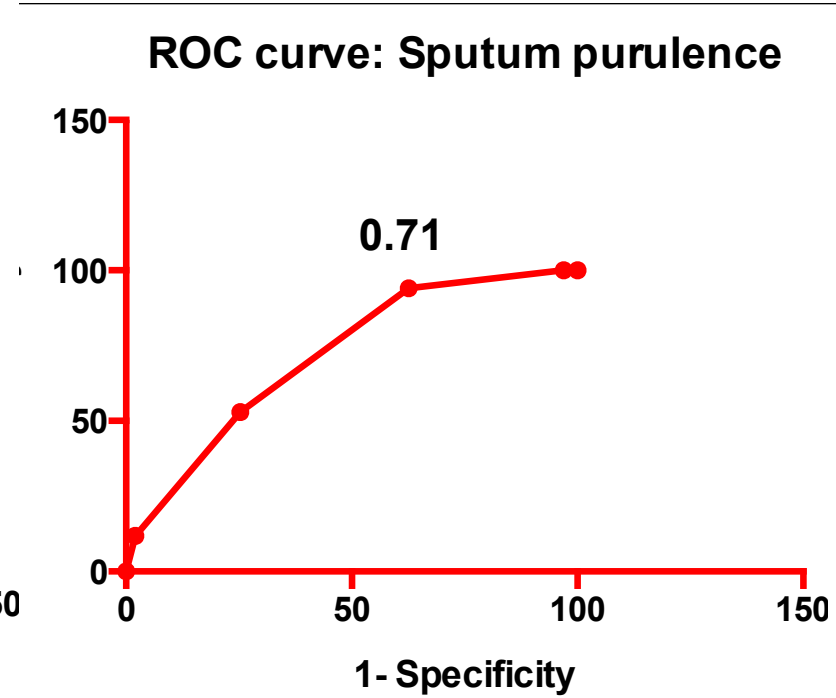
ERJ 2009;34:361-4

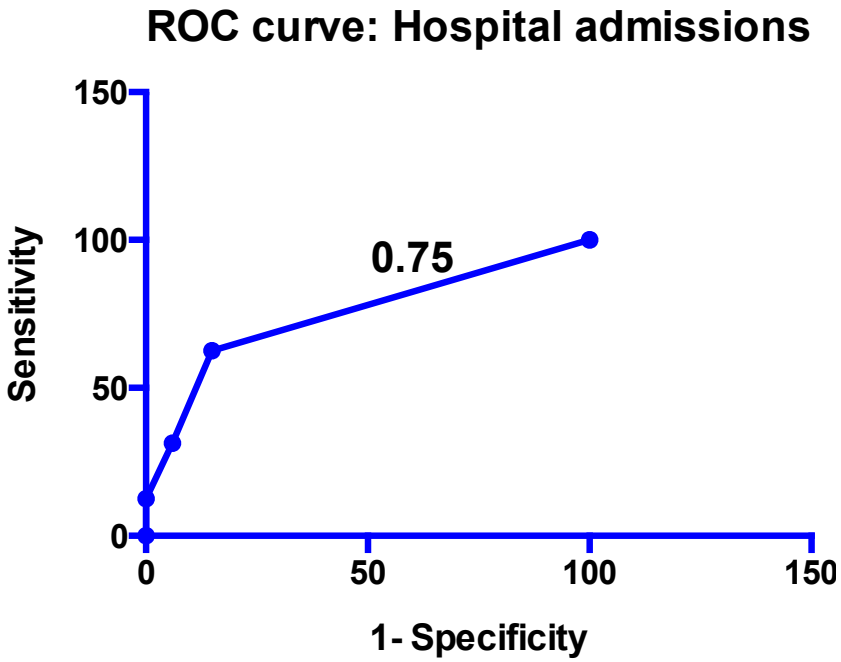
CT scoring in post-infective and idiopathic Bx (never or <5 PY)

- With multivariable logistic regression analysis (n=184)
- Two key factors in linking radiological and clinical severity
- A] degree bronchial dilatation
- B] no. bronchopulmonary segments with emphysema



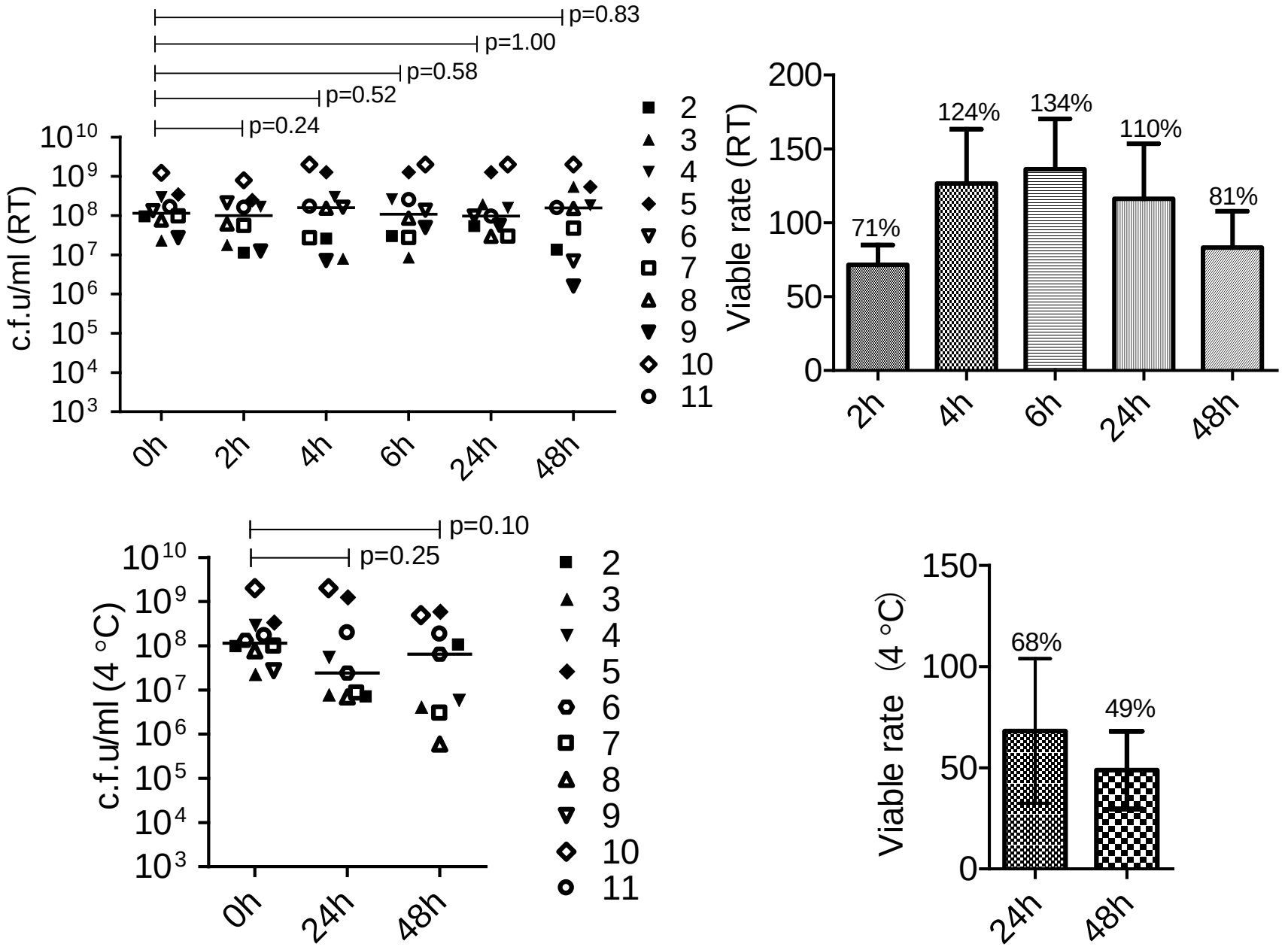

ROC curve: % Predicted FEV1
Sensitivity
150
100
50
0
0.79
0
50
100
150
1- Specificity

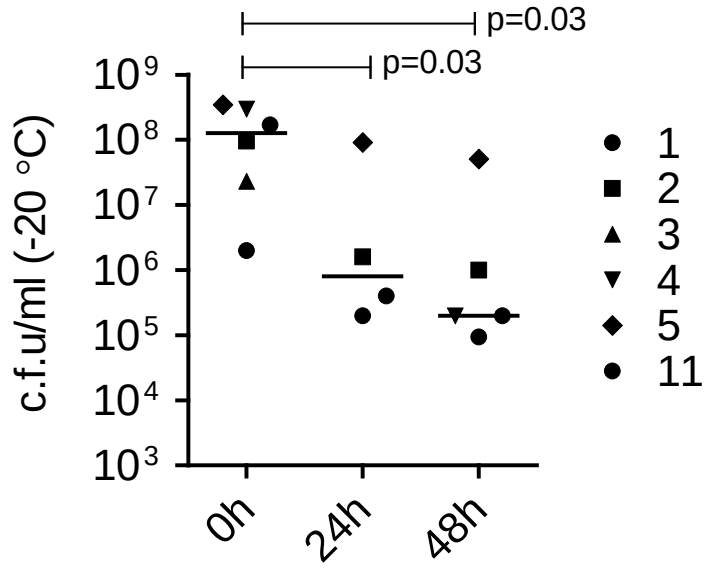

ROC curve: Sputum purulence
150
100
50
0
0.71
0
50
100
150
1- Specificity

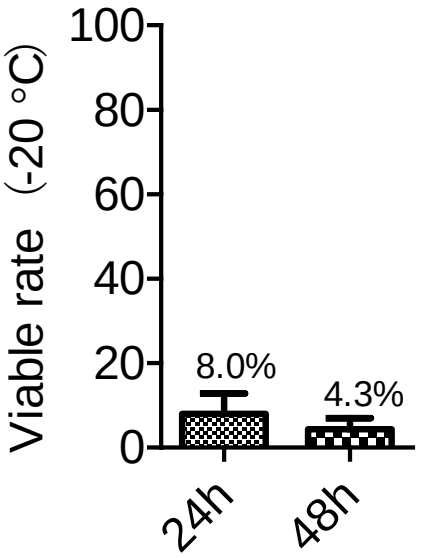

ROC curve: Hospital admissions
Sensitivity
150
100
50
0
0.75
0
50
100
150
1- Specificity

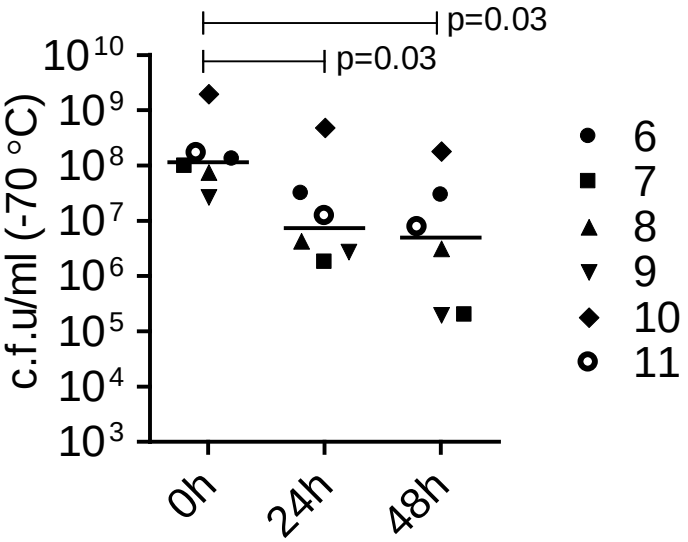
Research Fellows update

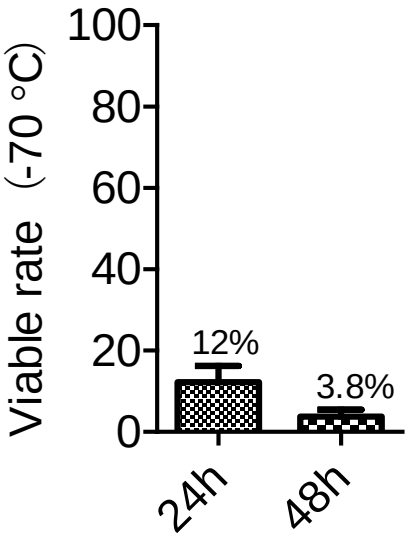
- Yang Zhang
- Completed MSc and awarded a distinction
- Studied how to best process sputum samples for those patients infected with the organism *Haemophilus influenzae*
- Awarded a Chinese Fellowship and doing a PhD exploring the importance of *Haemophilus influenzae* in bronchiectasis

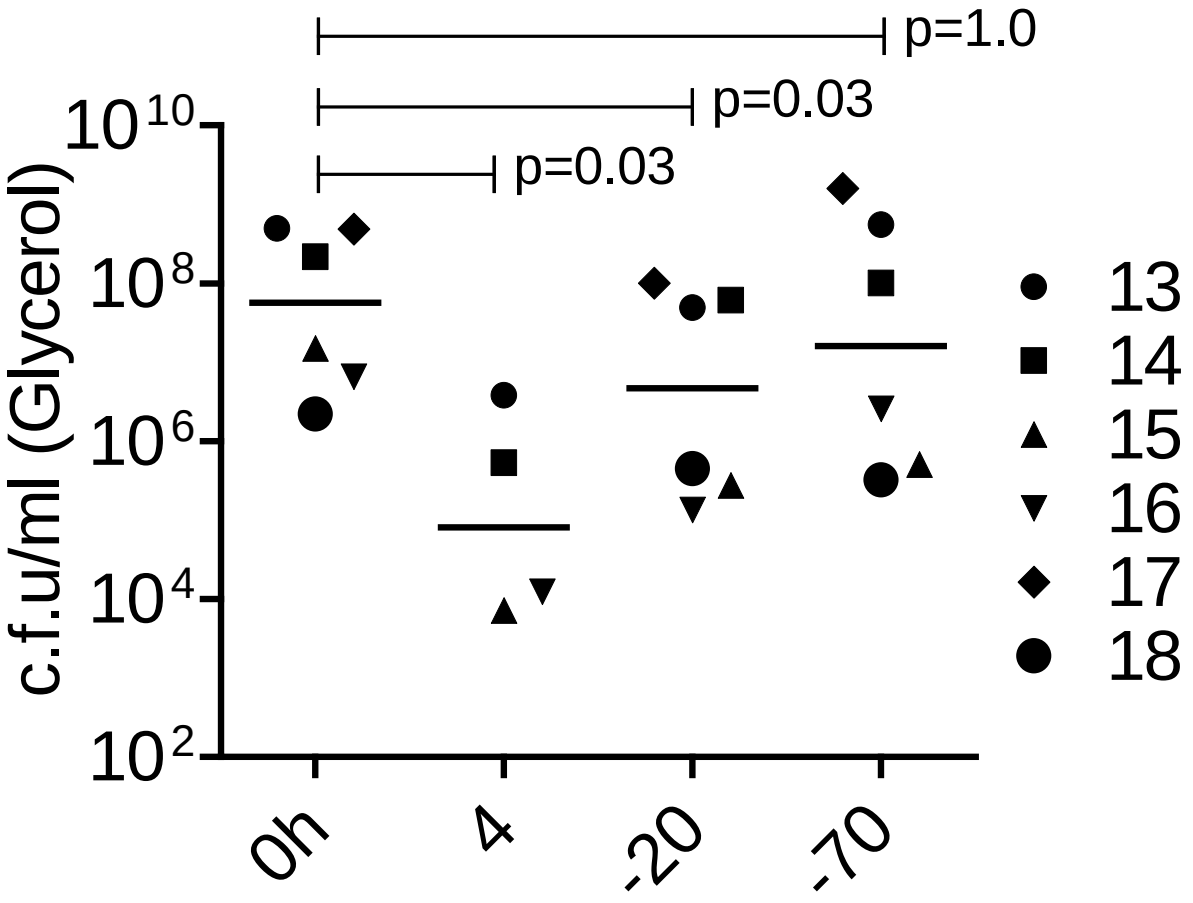

p=0.83
p=1.00
p=0.58
p=0.52
p=0.24
c.f.u/ml (RT)
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
10^{3}
0h
2h
4h
6h
24h
48h
2
3
4
5
6
7
8
9
10
11
Viable rate (RT)
200
150
100
50
0
71%
124%
134%
110%
81%
2h
4h
6h
24h
48h
p=0.10
p=0.25
c.f.u/ml (4 °C)
10^{10}
10^{9}
10^{8}
10^{7}
10^{6}
10^{5}
10^{4}
10^{3}
0h
24h
48h
2
3
4
5
6
7
8
9
10
11
Viable rate (4 °C)
150
100
50
0
68%
49%
24h
48h

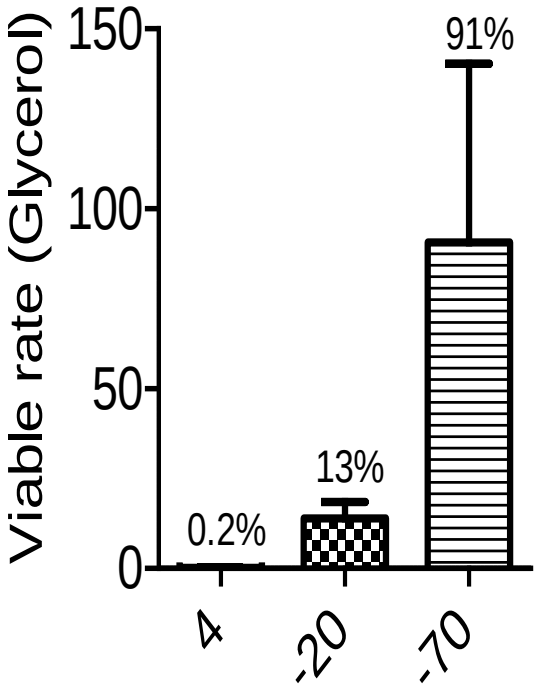

p=0.03
p=0.03
c.f.u/ml (-20 °C)
10^9
10^8
10^7
10^6
10^5
10^4
10^3
0h
24h
48h
1
2
3
4
5
11


Viable rate (-20 °C)
100
80
60
40
20
0
8.0%
4.3%
24h
48h


p=0.03
p=0.03
c.f.u/ml (-70 °C)
10^{10}
10^9
10^8
10^7
10^6
10^5
10^4
10^3
0h
24h
48h
6
7
8
9
10
11

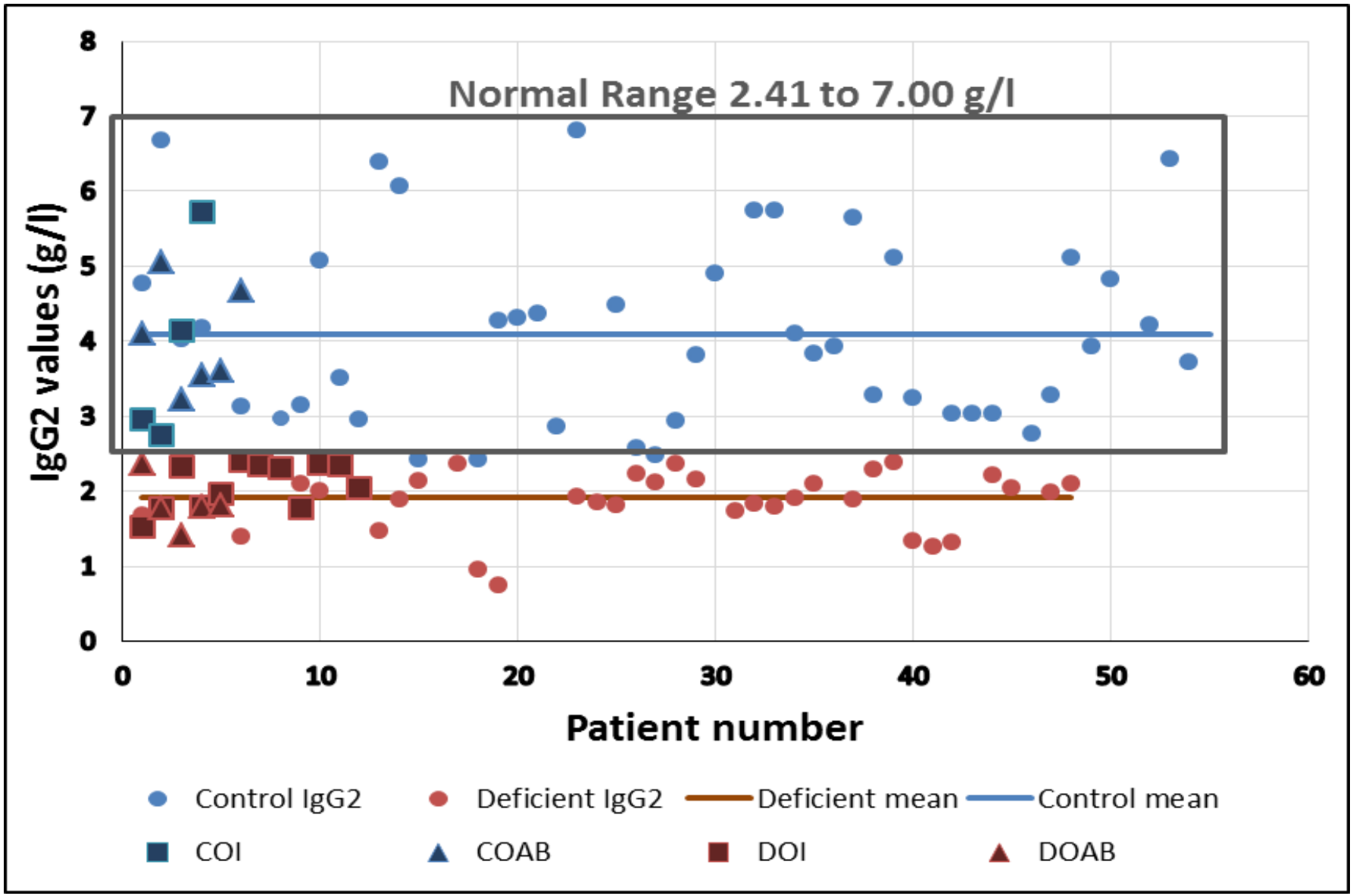

Viable rate (-70 °C)
100
80
60
40
20
0
12%
3.8%
24h
48h

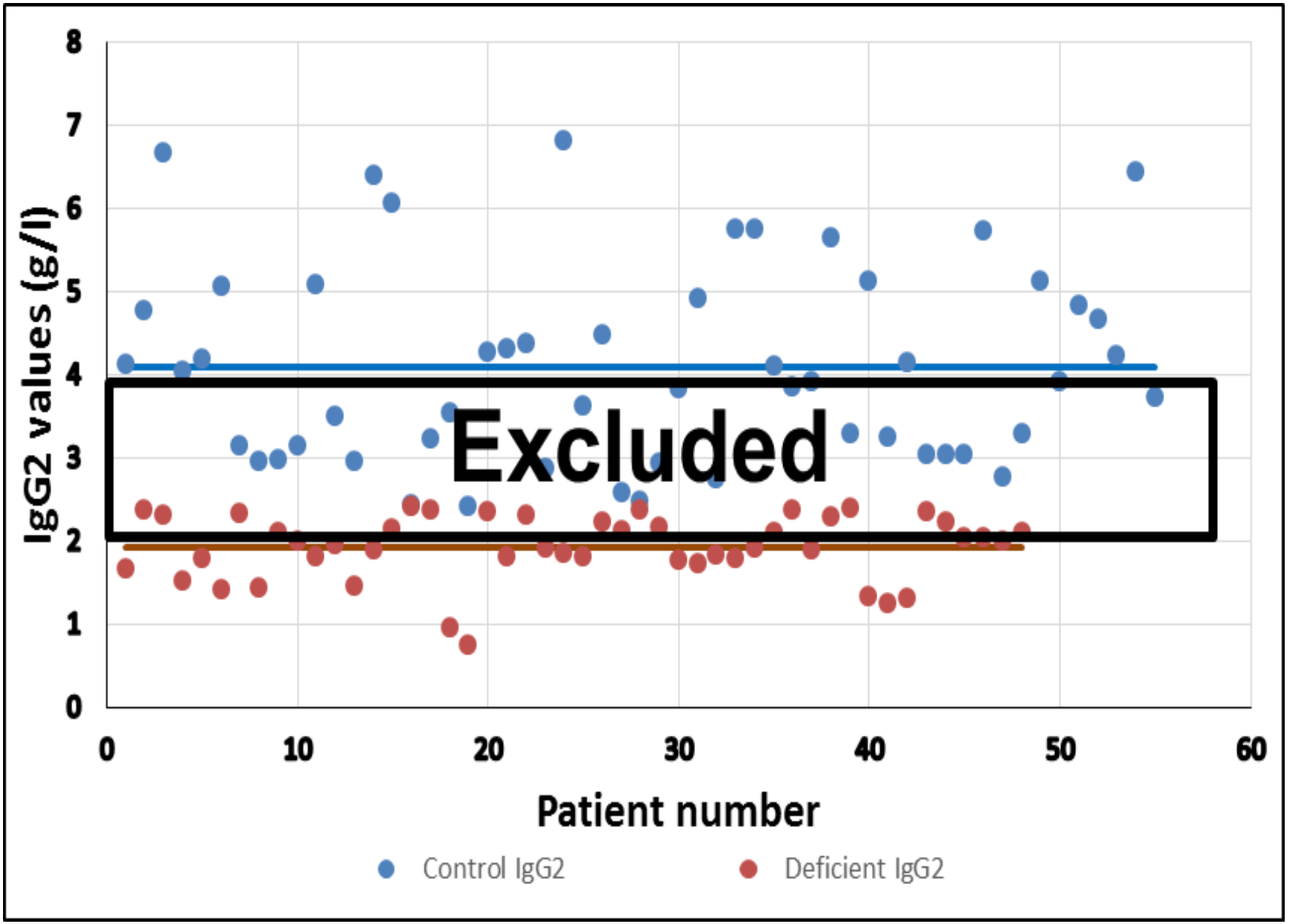

p=1.0
p=0.03
p=0.03
c.f.u/ml (Glycerol)
10^{10}
10^{8}
10^{6}
10^{4}
10^{2}
0h
4
-20
-70
13
14
15
16
17
18


Viable rate (Glycerol)
150
100
50
0
0.2%
13%
91%
4
-20
-70

Research Fellows update

- Khatarina
- Awarded and MSc
- Studied whether IgG2 deficiency leads to worse bronchiectasis
- Conducting a PhD exploring the importance of *IgG2* deficiency in how neutrophils and macrophages eat bacteria


Normal Range 2.41 to 7.00 g/l
IgG2 values (g/l)
Patient number
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
60
Control IgG2
Deficient IgG2
Deficient mean
Control mean
COI
COAB
DOI
DOAB


IgG2 values (g/l)
8
7
6
5
4
3
2
1
0
0
10
20
30
40
50
60
Patient number
Excluded
Control IgG2
Deficient IgG2

	Deficient		Controls		P-value
Bacterial Pathogens	**Number**	**Percent**	**Number**	**Percent**	
P. aeruginosa	8	13	2	5	0.08
***P. aeruginosa* and coliforms**	13	21	5	12	0.02
Gram-positive	13	22	10	25	1
Gram-negative	34	78	26	75	

BSI

	Mean	Median	25th	75th	Statistical test performed	P-value
Deficient	9	9	6	12	t-test	0.002
Control	5	4	3	8		

Chest infections

	Mean	Median	25th	75th	Statistical test performed	P-value
Deficient	7	6	2	8	MWU-test	0.03
Control	4	4	2	5		

Research Fellows update

- Elena
- Completing MSc
- Studying the importance of *Stenotrophomonas maltophilia* in bronchiectasis
- Will present her results at a future meeting
- Planning to become a Medical Dr

Research Fellows update

- Cathy
- Supporting team doing microbiology
- Starting to study whether cross infection is a possibility or not- no evidence to date
- Will present her results at a future meeting

Other studies in Bx

- 1] POL7080- update- a new anti-pseudomonal antibiotic
- 2] Statin in patients with *Pseudomonas aeruginosa*- exciting 3 month study and will present results at a future meeting
- 3] Study trying to shorten IV antibiotic treatment from 14 days to either 7d or 10d- antibiotics stopped if bacteria are present in low numbers or not present

- MRC Funded Bronchiectasis Research Network 0.7M
- Led by Dr A de Soyza in Newcastle
- Edinburgh one of the UK Centres
- Following 175 Patients over 2-3 years and storing DNA
- 15-20 Patients followed every 3m- CLINIMETRICS study
- Linking in with European Database EMBARC

IMI grant- iABC study

- International study
- Led by Stuart Elborn Belfast
- 30M Euros funded by European Union and Industry
- Edinburgh lead phase 3 study of inhaled tobramycin in bronchiectasis (partner Eva Polverini Spain)

iABC

inhaled Antibiotics in Bronchiectasis and Cystic Fibrosis

Research with Dr Dhaliwal

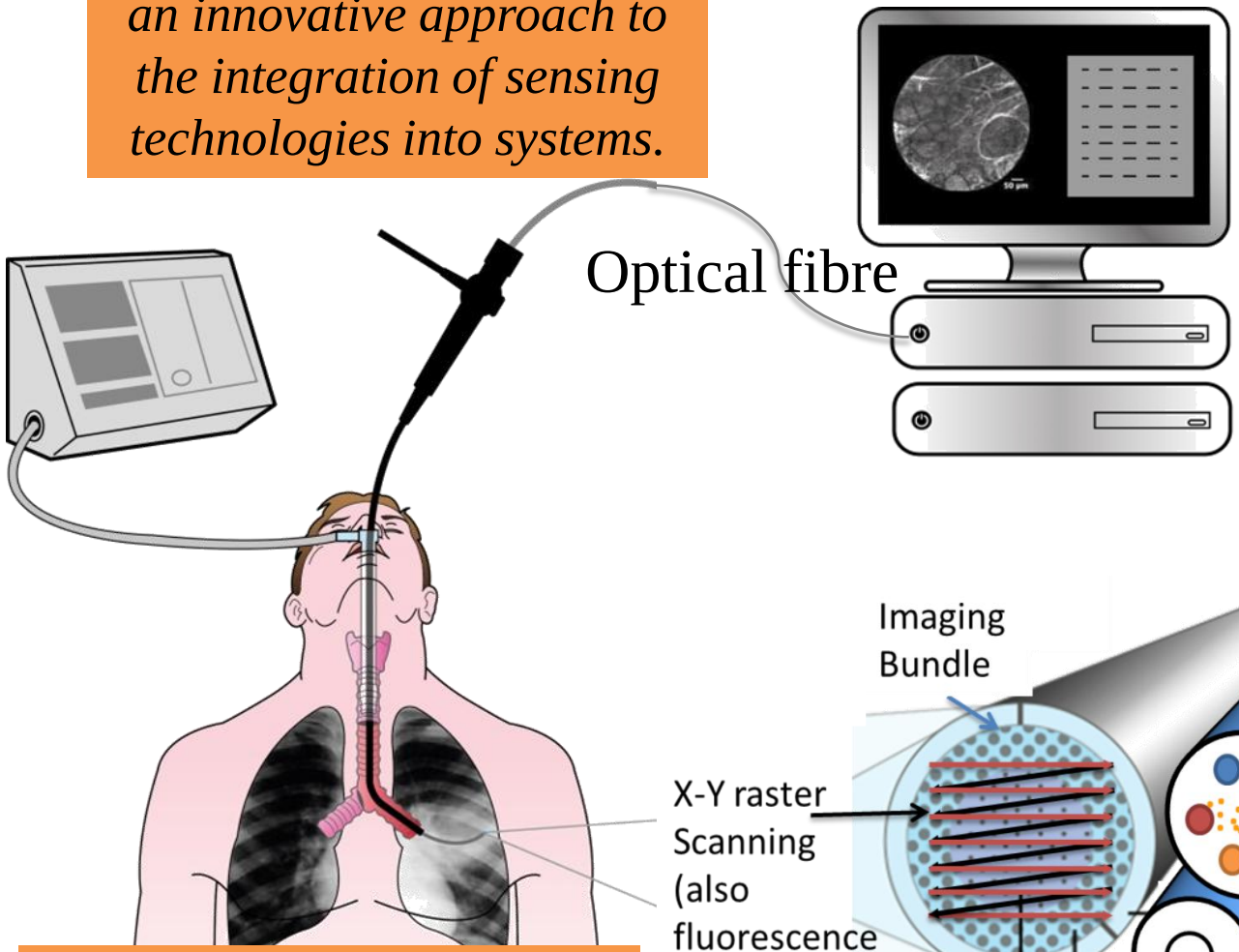
- Novel optical imaging

- Pilot studies to determine whether we can label activated white cells in the airways and label bacteria in the alveoli- the part of the lung involved in gas exchange

System and Integration

PROTEUS

an innovative approach to the integration of sensing technologies into systems.

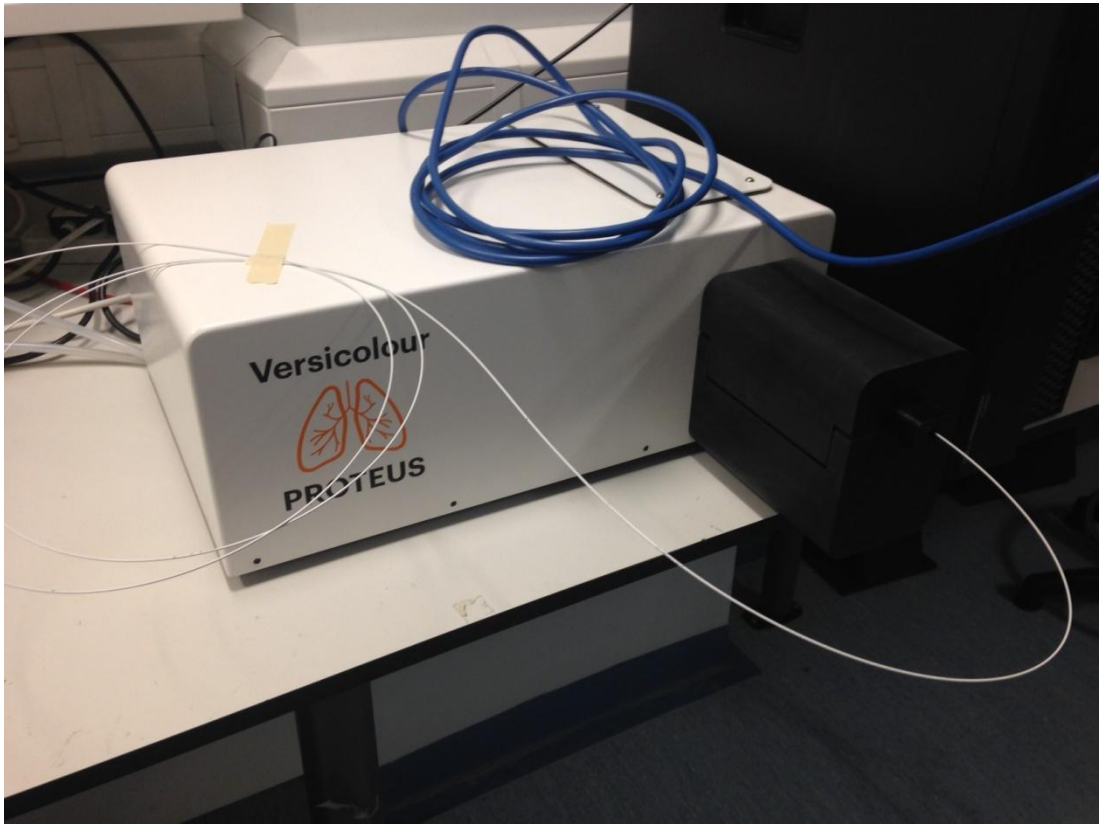


data integration and conversion to information for decision making

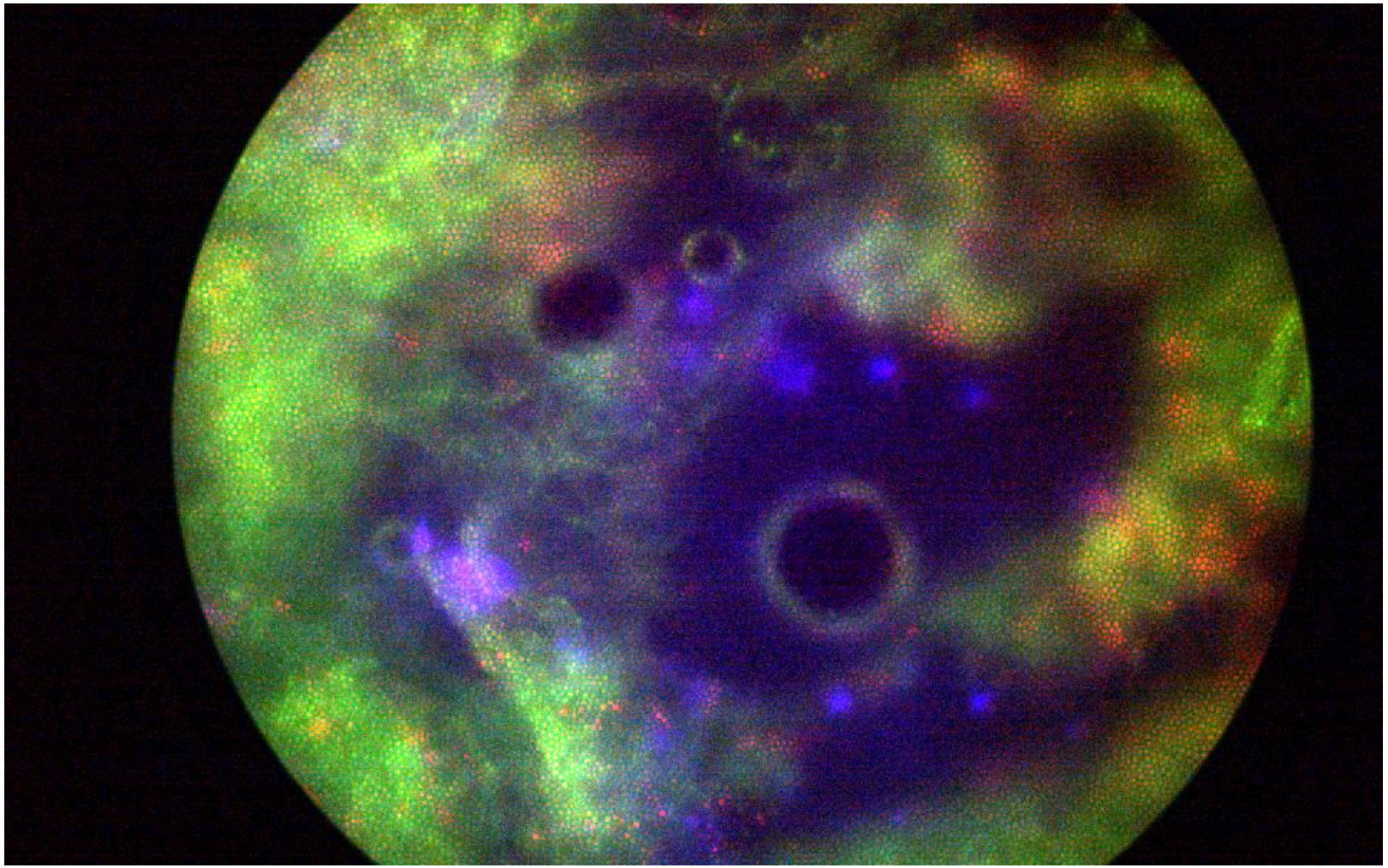
Novel sensors (Probes and reporters)

Detect and measure physical conditions and biomedical

Instrument hardware



Green – ex vivo human lung, red – bacteria, NIR - cells



Ex vivo CF Lung with segmental NAP administration