**Aim:** Molecular typing of *Pseudomonas aeruginosa* strains isolated from sibling CF patients

O. Ozcakir1, O. Esen1, E. Yalcin2, U. Ozelci2, B. Sener1, N. Cobanoglu2, D. Dogra2, N. Kiper2. 1 Dept. of Clinical Microbiology, 2 Pediatric Pulmonology Unit, Hacettepe Univ. Medical Faculty, Ankara, Turkey

**Introduction:** *Pseudomonas aeruginosa* (PA) strains infecting CF patients may either originate from the environment or cross-infection among CF patients as well as transmission from patients without CF may also occur. This study was aimed to understand the diversity and genomic relatedness of PA isolates from sibling CF patients.

**Methods:** Consecutive PA strains isolated between 1997–2004 from five siblings were genotyped by arbitrarily primed-PCR (AP-PCR). Following initial testing by three different DNA extraction methods and eight arbitrary primers to screen for the ability to produce discriminatory DNA polymorphisms, CTAB method was chosen for DNA extraction and ERIC-2 primer for PCR amplification.

**Results:** The patients found to harbor PA isolates with one to two different genotypes during their follow-up. In three pairs, siblings were colonized by closely related genotypes, while in the other two pairs siblings harbored unrelated genotypes. Persistent colonization over a 12 months period by a unique genotype was determined in 8 patients. Some unrelated patients shared strains with closely related AP-PCR patterns.

**Conclusion:** These data revealed that although the lungs of CF patients may be colonized by a persistent PA isolate, there may be transient colonizations as well. The presence of different genotypic strains in a patient may be explained by the isolation of strains colonizing different segments of the lungs during different sampling times. The demonstration of intrafamilial transmission between sibling CF patients and also cross transmission among unrelated patients, emphasize the need for more cautious segregation policies and hygienic precautions for CF patients.

**Effect of different environmental conditions on survival of *Pseudomonas aeruginosa* (PA) within artificially generated aerosols**

L.J. Clifton1, L.A. Fletcher2, C. Beggs2, D.G. Peckham1, S.P. Conway1. 1 Regional CF Unit, Seacroft Hospital, 2 Aerobiological Research Group, University of Leeds, 3 School of Engineering, Design and Technology, University of Bradford, UK

**Aims:** The aim of the study was to determine the effect of temperature and relative humidity (RH) on the survival of PA within aerosols in a laminar flow aerobiological apparatus.

**Methods:** Aerosols were generated using a Collison 3-jet nebuliser containing 0.25×Ringer’s solution inoculated with PA to give a concentration of 105 CFU/mL. The aerosol was delivered into a laminar flow device under controlled conditions of temperature and RH. Air samples were obtained using an Andersen 6-stage impactor containing nutrient agar plates. After overnight incubation the colonies were counted. The count was corrected using positive-hole correction and the concentration of viable bacteria within the air sample was calculated.

**Results:** Increasing the air temperature from 21°C to 27°C, while maintaining RH at 45% resulted in a significant drop in the concentration of viable PA isolated from the air (χ2 P < 0.05). Increasing the RH from 45% to 67%, while maintaining air temperature at 21°C resulted in a significant fall in the actual concentration of viable PA isolated from the air, but improved survival with aerosol age (χ2 P < 0.05).

**Conclusions:** Recent studies have demonstrated that airborne dispersal of PA from patients with CF may be important for transmission of epidemic strains. This study demonstrates that the air temperature and humidity are important for the survival of PA within the air in artificially generated aerosols and therefore it is important to consider the environmental conditions of areas designated for the care of patients with CF. By decreasing air humidity and increasing temperature the survival of PA within aerosols may be reduced.

**A study of duration of airborne contamination by a new transmissible multiresistant *Pseudomonas aeruginosa* strain**

P. Meyer1, S. Andersson-Marfiorio1, A.C. Petersson1, 1 CF unit, Pediatric Clinic, 2 Clinical Microbiology and Immunology, University Hospital, Lund, Sweden

**Background:** The most important factor in patient to patient spread of transmissible multiresistant *Pseudomonas aeruginosa* (Pa) may be aerosol dissemination. Panagea et al. (1 Hosp Inf 2005; 59: 102–107) showed recently that the Liverpool epidemic strain (LES) could be isolated from the air suggesting enhanced survival of Pa in aerosols. A new transmissible multiresistant strain of Pa called J-strain (Pa J) has been identified in Sweden 2005.

**Aim:** To study the potential and duration of airborne contamination of a new transmissible multiresistant Pa strain.

**Methods:** Air sampling was performed before, during and after airway clearance therapy (apt) with a patient chronically infected by Pa J. Apt included inhalation therapy, airway clearing manoeuvres and physical exercise. The air sampler with a MacDonkey-agar-agar strip was positioned approx 100 cm from the patient, and set at 50 L/min for 20 min. In total 13 samples (1 m3/agar strip) were collected, one sample before apt, one during, one immediately after apt and five samples at one hour interval thereafter. Five samples were collected from the corridor before and after apt.

**Results:** No bacterial growth was obtained before start of apt. Pa J was isolated from samples collected during and immediately after the intensive apt (1 cfu each sample). The following five samples were all negative as were all samples from the corridor.

**Conclusions:** Our data add new information about potential airborne transmission of Pa J. In contrast to the results from studies of the LES positive air samples with Pa J was only observed during and shortly after apt and not in the corridor outside the room. The results may be useful when deciding segregation routines.

**Ability of different strains of *Pseudomonas aeruginosa* (PA) to survive within artificially generated aerosols**

I.J. Clifton1, L.A. Fletcher2, C. Beggs2, M. Denton3, D.G. Peckham1, S.P. Conway1. 1 Regional CF Unit, Seacroft Hospital, 2 Aerobiological Research Group, University of Leeds, 3 School of Engineering, Design and Technology, University of Bradford, UK

**Aims:** The aim of the study was to determine whether different strains of PA survived within artificially generated aerosols in a laminar flow aerobiological apparatus.

**Methods:** Using pulsed field gel electrophoresis the following strains of PA were identified: non-epidemic, Manchester, Liverpool, Seacroft, and Leeds Paediatric. Aerosols were generated using a Collison 3-jet nebuliser 0.25×Ringer’s solution inoculated with each strain of PA to give a concentration of 105 CFU/mL. The aerosol was delivered into a laminar flow device under controlled conditions of temperature and relative humidity. Air samples were obtained using an Andersen 6-stage impactor containing nutrient agar plates. After overnight incubation the number of colonies counted. The count was corrected using positive-hole correction and the concentration of viable bacteria within the air sample was calculated.

**Results:** There was no significant difference in concentration of viable PA isolated from the air for any of the non-mucoid strains of PA (χ2 P NS). When mucoid PA was used there was a significant increase in the concentration of viable bacteria isolated from the air (χ2 P < 0.05).

**Conclusions:** Recent studies have demonstrated that airborne dispersal of PA from patients with cystic fibrosis may be important for the transmission of epidemic strains of PA between patients. This study demonstrates that there is no difference in survival between both the non-epidemic and epidemic strains of PA when expressing a non-mucoid phenotype. It would seem that the mucoid phenotype is important for survival artificially generated aerosols.