It’s not difficult to guess that research into the respiratory system is dominated by disease topics. This fact, however, immediately turns it into a rather broad field, the reason being that lung and airway diseases are probably more diverse than the diseases of any other human organ system. One of the consequences, therefore, is that apart from the “obvious” fields of pneumology, pulmology and internal medicine, quite a variety of other medical fields are also attracted to lung research.

The most obvious example, of course, is lung cancer, which certainly is a major research topic for many oncologists and pathologists. This fact, however, is actually nothing unusual since the same is true for more or less every organ system that can be affected by tumour development.

In contrast, more specific variety is introduced to the field by two other pre-dominating airway diseases: asthma and chronic obstructive pulmonary disease (COPD). Among other factors (smoking, for example), one of the main underlying reasons for both of those malfunctions is the fact that the respiratory system interacts with our environment in a much more direct manner than the majority of other organs. Therefore, in the cases of asthma and COPD, considerable numbers of researchers from epidemiology and public health, immunology and allergology, environmental and occupational medicine, social medicine and paediatrics also enter the “respiratory field”.

One system, much input

However, this is still not the end of the line. So far, we still haven’t spoken about lung and airway infections, such as tuberculosis, which means we should also keep our eyes peeled for microbiologists, infectiologists and, once again, immunologists. And, of course, all the physiologists, biochemists, cell and molecular biologists, etc. who perform basic research into the function of the respiratory system also remain to be mentioned.

So, when it comes to a publication analysis of European respiratory research – shouldn’t it be a bit like comparing apples with oranges given this remarkable variety of disciplines involved? Wait and see!

First of all, one “technical” point. Many of the “top papers” on respiratory research are, indeed, published in multidisciplinary journals like *Nature*, *Science* or *The Lancet*. Nevertheless, we had to restrict a certain part of the analysis to the 43 expert journals listed in the subject category “Respiratory System” of Thomson Reuter’s database *Web of Science*, which was used for this analysis. The reason is that *Web of Science* doesn’t provide any sufficiently reliable tools to automatically extract relevant respiratory system articles from those multidisciplinary journals. Of course, as a result, some of the most prominent papers in the field have been omitted from the performance analysis of individual countries (see tables p. 37). Despite this limitation, however, we believe that a survey, restricted to the specialist journals only, still provides sufficiently valid indicators for the countries’ overall productivity in respiratory system research. On the contrary, rankings of the most-cited researchers and papers (see tables, p. 38) could be analysed from publications in all journals.

Not many surprises

Given this directive, let’s have a look at how the publication performance in respiratory research during the period 1998-2009 is distributed among the individual European countries. The fact that England emerges as the “winner” in terms of number of articles and overall citations isn’t really unexpected. What is somewhat of a surprise, however, is just how wide the gap is to followers, Germany and France. Both those countries each achieved barely 55% of England’s article count; and even both together collected a mere handful more citations than their English colleagues.
Otherwise, the list hardly reveals any further surprises. In terms of overall citations, the individual countries more or less appear at their “usual” positions when compared to other biomedical disciplines. And when it comes to average citation rates, it’s yet again the Nordic countries that climb to the top, headed by Sweden with 18.4 citations per article, followed by Denmark with 17.0 and Finland with 16.0. Perhaps a small surprise in this respect might be that, among the large European research nations, it was Germany that this time achieved the highest average citation rate with 12.8 citations per article.

And beyond the European borders? When compared to their US colleagues, European publications in the expert journals for respiratory research system research altogether collected only marginally more citations (597,000 vs. 584,000). The US-based authors, however, actually needed a considerably lower total number of publications to achieve that “tie” in citation frequency.

Furthermore, Canada, in particular, turned out to be a strong performer in respiratory system research: only slightly fewer publications in total when compared to Germany and France, but clearly more citations in total – thanks to the comparatively high average rate of 16 citations per article.

Interestingly, the predominance of England in European respiratory system research is not so clearly reflected by the lists of the most-cited papers and authors. Of the five most-cited papers with European correspondence addresses, numbers one and four come from England, whereas numbers two and three are from Germany and number five from France. In terms of topics, numbers one and two are about asthma, number four about chronic obstructive pulmonary disease (COPD), and numbers three and five are clinical drug studies on the therapy of pulmonary hypertension.

**Oranges in the apple basket?**

A similar picture, at first view, emerges when looking at the 30 most-cited authors of European respiratory research. Nine researchers from England made it into this “Top 30” but also nine from Germany (and three from France).

The top positions, on the other hand, are firmly in English hands: the first place went to Peter Barnes, director of the National Heart and Lung Institute at the Imperial College in London (which incidentally brought four more of its researchers into the “Top 30”). He was followed by Stephen Holgate, Southampton, in second place and David Strachan, London, in fourth. All three are mainly asthma specialists but with each one taking a different approach: Barnes combines basic and clinical research into asthma therapy, Holgate investigates the immunology of asthma, whereas Strachan studies its epidemiological aspects.

Gerald Simonneau, Paris, and Werner Seeger, Gießen, in places three and seven, respectively, head the group of pulmonary hypertension specialists in the list, whereas Heinz Wichmann (5th) and Erika von Mutius (6th), both Munich, also add to the expectedly strong performance of asthma researchers.

Wichmann, however, also highlights a certain “problem”. Being an epidemiologist, he only achieved a part of his papers with studies on asthma or other airway diseases, whilst also publishing on tumour or cardiovascular diseases. Similar cases are not only provided by other epidemiologists but also by some allergologists – like, for example, Ulrich Wahn (Berlin, 12th) who published about half-and-half on asthma and allergic skin diseases.

Seen this way, there might indeed be a few oranges in the apple basket!  

**Ralf Neumann**
**Most Cited Authors...**

   Citations: 26,476  
   Articles: 470

   Citations: 14,123  
   Articles: 312

   Citations: 13,213  
   Articles: 176

   Citations: 12,814  
   Articles: 158

5. Heinz-E. Wichmann, Epidemiol. Helmholtz Ctr. Munich  
   Citations: 12,489  
   Articles: 344

6. Erika von Mutius, Dr. v. Haunersches Children's Hosp. Univ. Munich  
   Citations: 12,188  
   Articles: 180

7. Werner Seeger, Internal Med. Univ. Giessen  
   Citations: 10,031  
   Articles: 339

   Citations: 8,927  
   Articles: 223

   Citations: 8,806  
   Articles: 207

    Citations: 8,331  
    Articles: 295

    Citations: 8,011  
    Articles: 226

    Citations: 7,705  
    Articles: 273

    Citations: 7,668  
    Articles: 115

    Citations: 7,651  
    Articles: 150

15. Joachim Heinrich, Epidemiol. Helmholtz Ctr. Munich  
    Citations: 7,595  
    Articles: 277

16. Friedrich Grimminger, Lung Ctr. Univ. Giessen  
    Citations: 7,540  
    Articles: 239

    Citations: 7,286  
    Articles: 128

    Citations: 7,285  
    Articles: 138

    Citations: 7,268  
    Articles: 218

    Citations: 6,903  
    Articles: 211

    Citations: 6,728  
    Articles: 97

    Citations: 6,660  
    Articles: 147

    Citations: 6,569  
    Articles: 124

    Citations: 6,534  
    Articles: 91

    Citations: 6,226  
    Articles: 173

    Citations: 6,215  
    Articles: 129

    Citations: 5,979  
    Articles: 161

    Citations: 5,954  
    Articles: 108

    Citations: 5,844  
    Articles: 61

... and Papers

1. Leckie, MJ; ten Brinke, A; Khan, J; [...] Chung, KF; Djukanovic, R; Hansel, TT; Holgate, T; Sterk, PJ; Barnes, PJ  
   Effects of an interleukin-5 blocking monoclonal antibody on eosinophils, airway hyper-responsiveness, and the late asthmatic response.  
   LANCET, 356 (9248): 2144-2148 DEC 23 2000  
   Citations: 724

2. Braun-Fahrlander, C; Riedler, J; Herz, U; [...] Renz, H; Nowak, D; von Mutius, E  
   Environmental exposure to endotoxin and its relation to asthma in school-age children.  
   Citations: 672

3. Ischewski, H; Simonneau, G; Galie, N; [...] Ewert, R; Siedentop, H; Seeger, W  
   Inhaled iloprost for severe pulmonary hypertension.  
   Citations: 543

4. Seemungal, TAR; Donaldson, GC; Paul, EA; Bestall, JC; Jeffries, D; Wedzicha, JA  
   Effect of exacerbation on quality of life in patients with chronic obstructive pulmonary disease.  
   Citations: 520

5. Galie, N; Ghofrani, HA; Tobibckl, A; [...] Grimminger, F; Kurzyna, M; Simonneau, G  
   Sildenafil citrate therapy for pulmonary arterial hypertension.  
   NEW ENGLAND JOURNAL OF MEDICINE, 353 (20): 2148-2157 NOV 17 2005  
   Citations: 519