



Publication Analysis 1997-2008

# Clinical Neurosciences

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England impressively carried its European lead in basic neuroscience (*LT* 1-2010, p. 32) over to clinical neurosciences. Finland achieved the most citations per article on average. Most-cited research topic was – no surprise – stroke.

In our latest publication analysis on ‘basic neurosciences’ (*Lab Times* 1/2010: 32-34) we stated, “The main problem was that even in clinical institutes (neurology, psychiatry...) a significant portion of research has to be regarded as basic neuroscience. So, how does one decide whether the research of a scientist working at a clinical institute is *basic* or *clinical* without having to check all their papers individually?”

This problem certainly persists when examining the same coin from the other side, i.e. from the ‘clinical neurosciences’ perspective.

This was not the only ‘twilight zone’, though. When speaking of ‘clinical neurosciences’, one would think at first hand of clinical neurology, neurosurgery and certain parts of neuroimaging. However, there are even more significant overlaps with quite a number of more (bio-)medical disciplines. This fact is rather obvious in the cases of, for example, clinical (neuro-)psychology or geriatric and rehabilitation medicine. In addition, however, a number of certain neurological topics clearly demand expertise from supposedly even more distant specialties, depending on the nature of the respective nervous system disease. Prominent examples are multiple sclerosis and immunology, brain fever and infectious medicine or stroke and vascular medicine.

## Neurology or psychiatry?

A very special issue in this respect, however, is the relation between neurology and psychiatry. Until today, both disciplines have structurally remained completely distinct: separate clinics and departments, separate training, separate learned societies and separate journals. Whether this distinction is still justified has been an ongoing debate since more and more mental illnesses, traditionally treated by psychiatrists, have turned out to clearly have their basis in the biology of the brain.

Joseph B. Martin, former Dean of Harvard Medical School and a neurologist by training, therefore wrote in his 2002 essay ‘The Integration of Neurology, Psychiatry, and Neuroscience in

the 21<sup>st</sup> Century’ (*Am. J. Psychiatry* 159: 695-704): “[...] the separation of the two categories is arbitrary, often influenced by beliefs rather than proven scientific observations. And the fact that the brain and mind are one makes the separation artificial anyway.” And he added, “[...] neurologic and psychiatric research are moving closer together in the tools they use, the questions they ask and the theoretical frameworks they employ. The development of functional imaging techniques, including magnetic resonance imaging, positron emission tomography, and computerised tomography with rapid infusion, are now used not only by neurologists and psychiatrists but also by psychologists and cognitive neuroscientists.”

## Taking account of ‘twilight zones’

What does this all mean in practical terms for our publication analysis ‘clinical neurosciences’? *Web of Science*, the database of Thomson Reuters used for this analysis, lists almost 160 journals in its category ‘Clinical Neurology’. This list, however, includes a significant number of journals, which also appear in other categories like ‘Neuroscience’ or ‘Psychiatry’, meaning that *Web of Science* thereby automatically takes into account the aforementioned ‘twilight zones’ of clinical neurosciences. Hence, this was the main reason why we made a clear publication focus in ‘Clinical Neurology’ journals, the key criterion for including individual researchers in our publication analysis ‘clinical neurosciences’.

However, there is still another important point that warrants explanation. As in basic neuroscience, many of the ‘top papers’ in the clinical neurosciences appear in multidisciplinary science journals like *Nature*, *Science*, *New England Journal of Medicine* or *The Lancet*. Regrettably, however, we had to omit them at least from the part of the analysis comparing the publication output of the individual countries (tables on next page). The reason is that *Web of Science* doesn’t provide any reliable tools to automatically extract relevant ‘clinical neuroscience’ articles from those multidisciplinary journals. 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 clinical neuroscience research. On the contrary, rankings of the most-cited researchers and papers (see tables, p. 34) could be analysed from publications in all journals.

The results of our analysis are presented in the tables and, in our view, are largely self-explanatory. Therefore, we don't want to delve too deep into the details of the lists nor shall we waste too many words on the most striking outcomes.

### Scandinavia as strong as usual

By overall number of articles published in the 'clinical neurology' journals between 1997 and 2008, Germany is Europe's number one. Nevertheless, it appears at second place 'only' in the European ranking. The reason being that England, despite publishing over 5,000 articles less than Germany (23,000 vs. 28,000), nonetheless achieved a significantly higher number of citations with those articles to-date (343,000 vs. 397,000). The gap behind these 'Big Two' is enormous, with Italy (174,000 citations) out-competing France (159,000 citations) in the race for third place.

England's excellent citations-per-article ratio of almost 15, however, was clearly topped by a couple of 'smaller' research nations. 'Leader' in this category is Finland with each article cited 18.4 times on average, followed by their Swedish neighbours (17.6), the Netherlands (15.5), Norway, Scotland (both 15.2) and Denmark (15.0). As often is the case in life sciences, this result again demonstrates the high quality of Scandinavian research. Disappointing, in contrast, is Spain's performance: only seven citations on average per clinical neuroscience article from the period 1997-2008.

Anyway, the strong publication performances of England and Germany – in particular, when compared to Canada and Japan – might, furthermore, be the main reason why in terms of overall citations Europe even stayed ahead of the USA. Most other biomedical disciplines yield an inverted image.

### Boosted by increasingly aging populations

The list of the most-cited heads in European clinical neurosciences immediately reveals one clearly dominating institute, the Institute of Neurology of the University College (UCL), London. John Hardy, Alan Thompson and David Miller, the three top-cited researchers have all worked there, and four more UCL colleagues also made the jump into the 'Top 30'. Altogether, 14 researchers working in an English institute made it into the 'Top 30'-list. This fact again demonstrates England's leading role in European clinical neurosciences, particularly given that the next best nations follow at a considerable distance: Germany 5 'heads', Netherlands 4 and France 3.

To have one last word about the most successful research topics, at least in terms of citations: four of the five most-cited articles are about stroke, which is obviously still the dominant issue in clinical neurosciences. When screening through the paper titles of the most-cited researchers further classic topics emerge: multiple sclerosis, epilepsy, sleep and movement disorders, headaches, to mention but a few. On the other hand, however, age-related neurodegenerative disorders like Alzheimer's disease, Parkinson's disease and Amyotrophic lateral sclerosis have steadily caught up during recent years.

Given our increasingly ageing population, that would mean that work won't get boring for clinical neuroscientists in the near future.

RALF NEUMANN

## Europe...

Country	Citations	Articles	Cit./Art.
1. England	342,765	23,055	14.9
2. Germany	306,998	28,185	10.9
3. Italy	173,560	15,989	10.9
4. France	159,370	13,154	12.1
5. Netherlands	134,701	8,719	15.5
6. Sweden	91,388	5,180	17.6
7. Spain	74,682	10,672	7.0
8. Switzerland	67,228	5,556	12.1
9. Austria	48,827	3,544	13.8
10. Finland	47,574	2,583	18.4
11. Belgium	46,142	3,932	11.7
12. Scotland	43,437	2,858	15.2
13. Denmark	41,184	2,751	15.0
14. Israel	34,646	3,465	10.0
15. Norway	30,189	1,990	15.2
16. Turkey	26,663	5,443	4.9
17. Greece	9,254	1,904	4.9
18. Poland	8,781	2,089	4.2
19. Hungary	8,739	1,160	7.5
20. Portugal	8,598	1,011	8.5

Articles appearing between 1997 and 2008 in clinical neuroscience journals as listed by Thomson Scientific's *Web of Science*. The numbers of citations are accurate as of February 2010. A country's figures are derived from articles where at least one author working in the respective European nation is included in the author's list. Israel is included because it is a member of many European research organisations and programmes (EMBO, FP7 of the EU...).

## ... and the World

	Citations	Articles	Cit./Art.
Europe	1,320,063	130,288	10.1
USA	1,251,231	94,104	13.3
Canada	201,802	13,787	14.6
Japan	176,242	22,013	8.0
Australia	90,645	7,104	12.8
South Korea	22,848	4,380	5.2
China	18,844	2,838	6.6



## Publication Analysis 1997-2008 – Clinical Neurosciences

### Most Cited Authors...

	Cit-ations	Art-icles
1. <b>John Hardy</b> , Inst. Neurol. Univ. Coll. London	20,174	306
2. <b>Alan J. Thompson</b> , Inst. Neurol. Univ. Coll. London	16,702	350
3. <b>David H. Miller</b> , Inst. Neurol. Univ. Coll. London	16,581	352
4. <b>Yves Agid</b> , Clin. Neurosci Pitié-Salpêtrière Univ. Hosp., INSERM, Paris	14,716	275
5. <b>Massimo Filippi</b> , Inst. Neurol. Univ. Hosp. Milan	14,594	447
6. <b>Bengt Winblad</b> , Aging Res. Ctr. Karolinska Inst. Univ. Stockholm	14,471	432
7. <b>Monique M.B. Breteler</b> , Epidemiol. & Biostat. Univ. Rotterdam	13,991	277
8. <b>Hans P. Hartung</b> , Neurol. Univ. Düsseldorf	13,374	306
9. <b>Alexis Brice</b> , Pitié-Salpêtrière Univ. Hosp., INSERM, Paris	12,775	312
10. <b>Frederik Barkhof</b> , Dept. Neurol. Vrije Univ. Amsterdam	12,571	358
11. <b>Giancarlo Comi</b> , Univ. Vita Salute San Raffaele Dept. Neurol. Milan	12,512	356
12. <b>David J. Brooks</b> , Cin. Neurosci Imperial Coll. London	12,361	265
13. <b>Chris H. Polman</b> , Neurol. Vrije Univ. Med. Ctr. Amsterdam	11,991	271
14. <b>Werner Hacke</b> , Neurol. Univ. Heidelberg	11,838	235
15. <b>Michael Weller</b> , Neurol. Univ. Hosp. Zurich	11,828	350
16. <b>John S. Duncan</b> , Inst. Neurol. Univ. Coll. London	11,449	345
17. <b>Christian E. Elger</b> , Clin. Epileptol. Univ. Bonn	11,373	456
18. <b>John R. Hodges</b> , MRC Cognition and Brain Sci. Unit Cambridge	11,075	242
19. <b>Nicholas W. Wood</b> , Inst. Neurol. Univ. Coll. London	10,976	266
20. <b>Andrew J. Lees</b> , Reta Lila Weston Inst. Neurol. Studies London	10,473	304
21. <b>Hans C. Diener</b> , Neurol. Univ. Duisburg-Essen	10,425	480
22. <b>Cathy J. Price</b> , Inst. Neurol. Univ. Coll. London	9,758	194
23. <b>Paul M. Matthews</b> , Clin. Neurosci. Imperial Coll. London	9,704	182
24. <b>Hans-Jürgen Möller</b> , Psychiat. & Psychotherapy Univ. Munich	9,605	524
25. <b>Peter Goadsby</b> , Inst. Neurol. Univ. Coll. London (since 2007 USA)	9,395	281
26. <b>Gareth J. Barker</b> , Clin Neurosci. Kings Coll. London	9,335	241
27. <b>Peter Brown</b> , Inst. Neurol. Univ. Coll. London	9,251	301
28. <b>Alim-Louis Benabid</b> , Clin. & Biol. Neurosci. Univ. Grenoble	9,026	193
29. <b>Barbara J. Sahakian</b> , Psychiatry Addenbrooke's Hosp. Univ. Cambridge	8,662	176
30. <b>Philip Scheltens</b> , Cogn. Neurol. Vrije Univ. Med. Ctr. Amsterdam	8,511	268



Citations of articles published between 1997 and 2008 were recorded up until February 2009 using the *Web of Science* database from Thomson Reuters. The "most cited papers" had correspondence addresses in Europe or Israel.

### ... and Papers

	Citations
1. <b>Davies, SW; Turmaine, M; Cozens, BA; ...; Scherzinger, E; Wanker, EE; Mangiarini, L; Bates, GP</b> Formation of neuronal intranuclear inclusions underlies the neurological dysfunction in mice transgenic for the HD mutation. <i>CELL</i> , 90 (3): 537-548 AUG 8 1997	1,098
2. <b>Farrell, B; Fraser, A; Sandercock, P; Slattery, J; Warlow, CP and the Europ. Carotid Surg. Trial Collaborat Grp.</b> Randomised trial of endarterectomy for recently symptomatic carotid stenosis: final results of the MRC European carotid surgery trial (ECST). <i>LANCET</i> , 351 (9113): 1379-1387 MAY 9 1998	1,060
3. <b>Bots, ML; Hoes, AW; Koudstaal, PJ; Hofman, A; Grobbee, DE</b> Common carotid intima-media thickness and risk of stroke and myocardial infarction - The Rotterdam Study. <i>CIRCULATION</i> , 96 (5): 1432-1437 SEP 2 1997	893
4. <b>Hacke, W; Kaste, M; Fieschi, C; ...; Donnan, G; Schneider, D; Diez-Tejedor, E; Trouillas, P</b> Randomised double-blind placebo-controlled trial of thrombolytic therapy with intravenous alteplase in acute ischaemic stroke (ECASS II). <i>LANCET</i> , 352 (9136): 1245-1251 OCT 17 1998	886
5. <b>Sandercock, P; Collins, R; Counsell, ...; vanGijn, J; Harrison, M; Wilhelmsen, L</b> The International Stroke Trial (IST): A randomised trial of aspirin, subcutaneous heparin, both, or neither among 19,435 patients with acute ischaemic stroke. <i>LANCET</i> , 349 (9065): 1569-1581 MAY 31 1997	801