

**Stem Cell Reports, Volume 4**

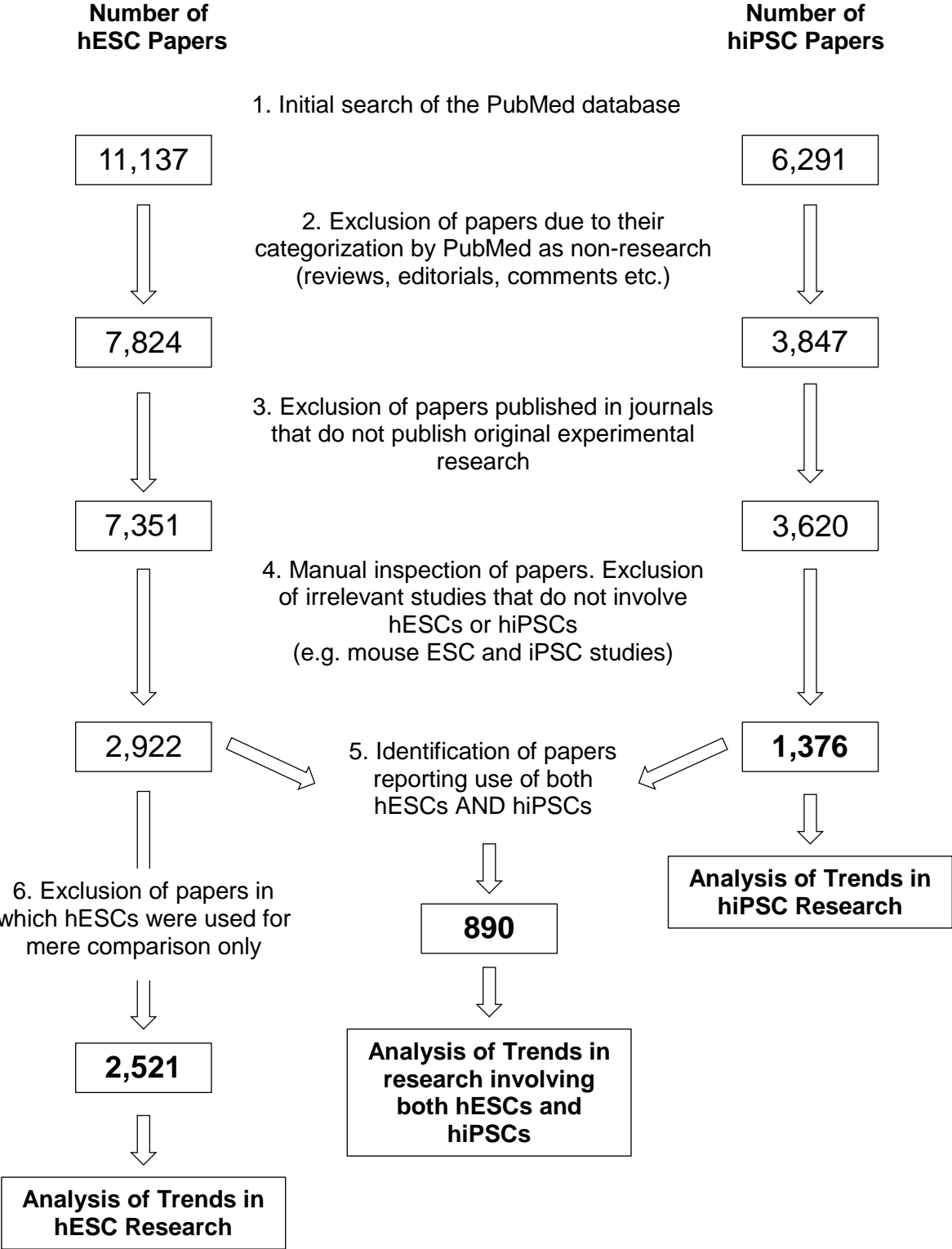
**Supplemental Information**

**Human Embryonic and Induced Pluripotent  
Stem Cell Research Trends: Complementation  
and Diversification of the Field**

**Sabine Kobold, Anke Guhr, Andreas Kurtz, and Peter Löser**

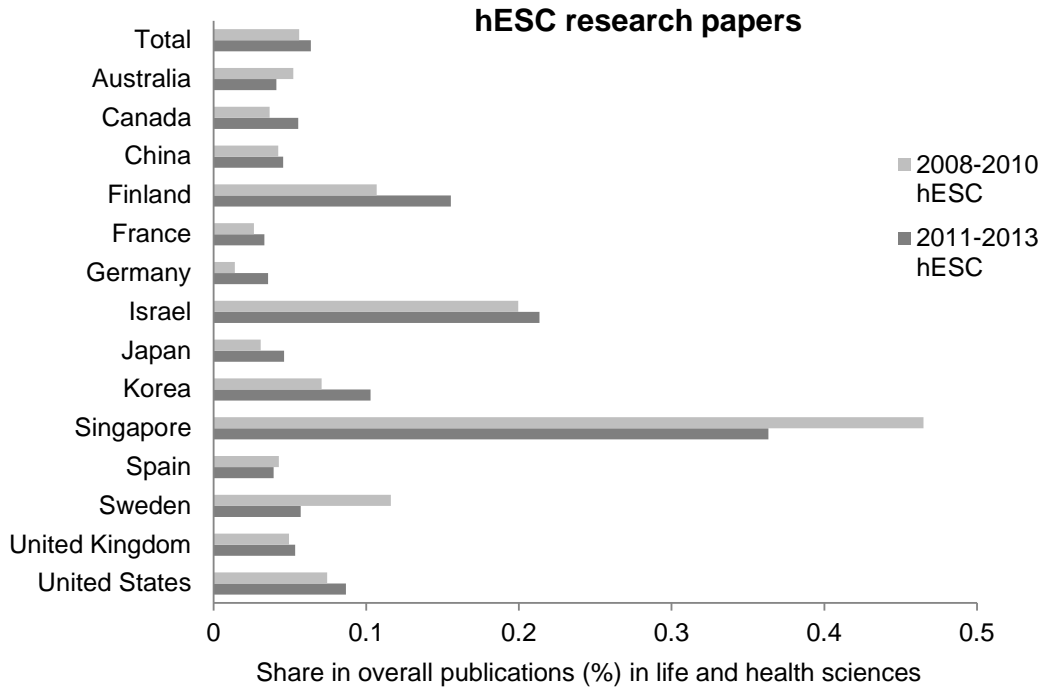
**Supplementary Figures**

**Suppl. Figure 1**

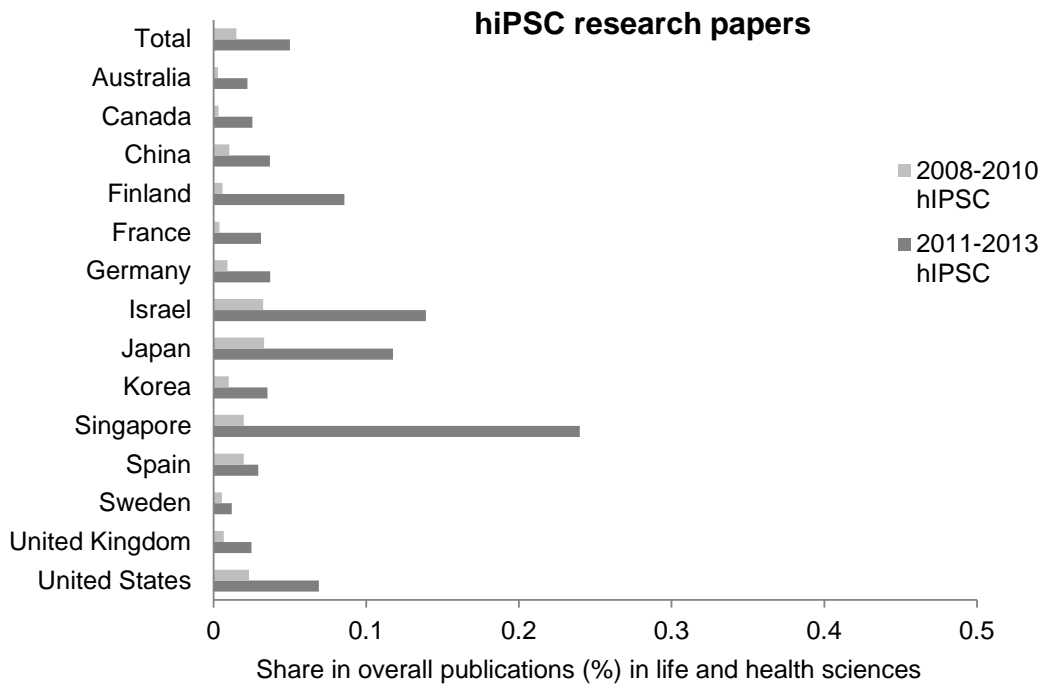


**Suppl. Figure 2**

**A**

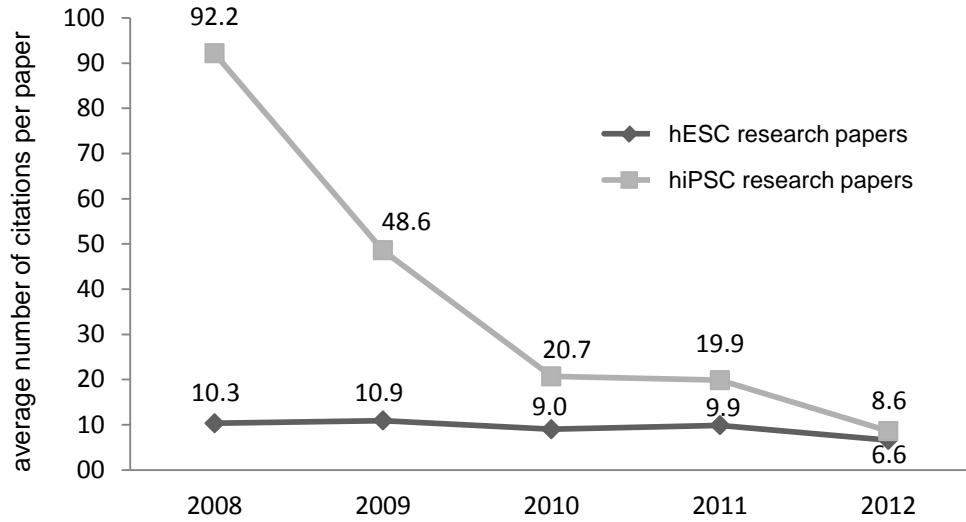


**B**

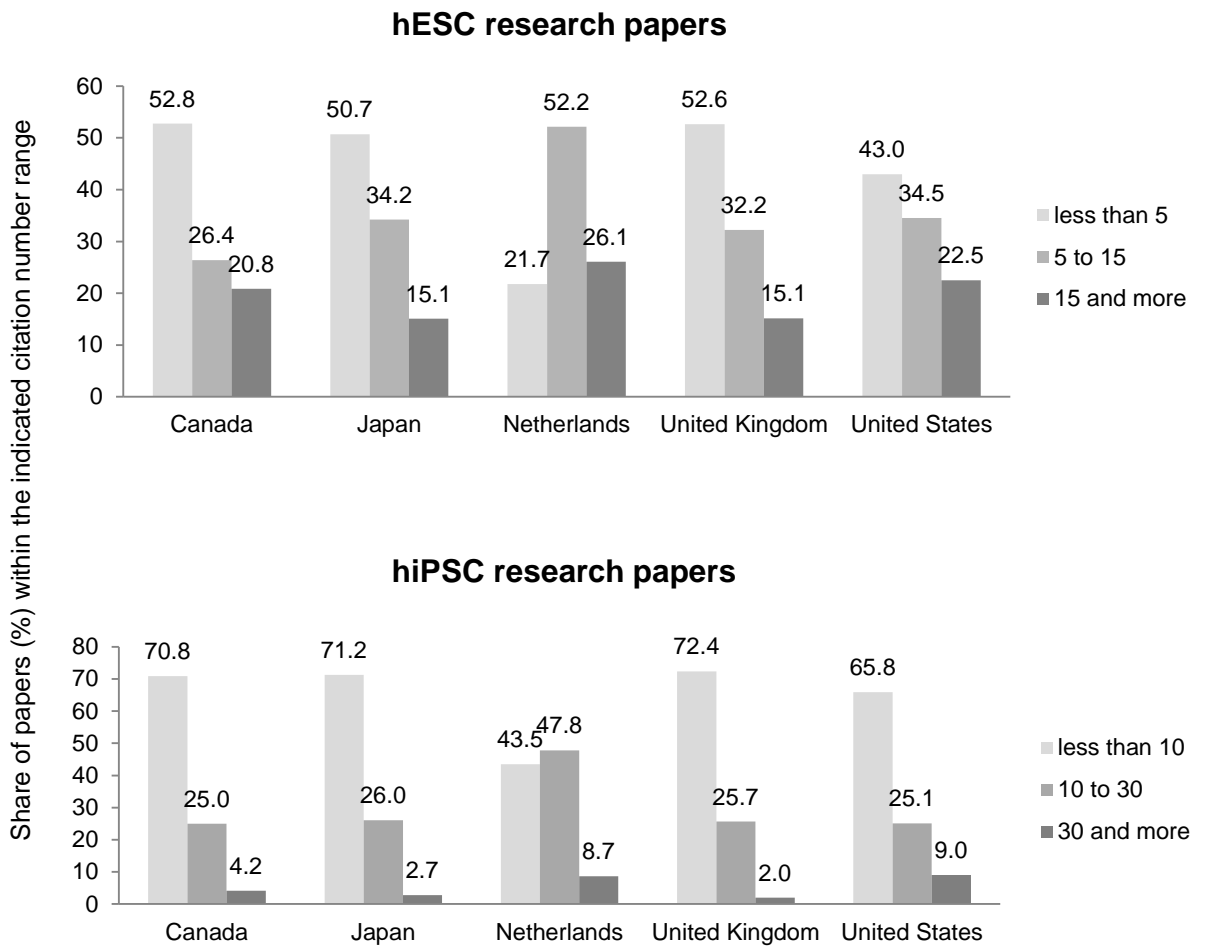


**Suppl. Figure 3**

**A**



**B**



## **Supplementary Figure Legends**

**Suppl. Fig. 1:** Flow chart of the paper selection process.

**Suppl. Fig. 2:** Share of hESC **(A)** and hiPSC **(B)** research papers in the total publication number from selected countries in life and health sciences. Please note that the total publication numbers for individual countries were determined from the Scopus database and, therefore, the same publication may be allocated to authors from more than one country.

**Suppl. Fig. 3: A:** Average overall citation frequencies per paper and year for hESC and hiPSC research papers published in the indicated years. **B and C.** Citation frequencies of papers from countries with the highest average impact in hESC **(B)** and hiPSC **(C)** research. Papers from individual countries were grouped according to their citation frequencies (less than 50%, 50 to 150% or more than 150% of average citation frequency per paper and year) and share of papers within the respective citation number range was determined.

## **Supplementary Methods**

### **Paper Selection**

Searches of the PubMed data base accessible through the NIH National Library of Medicine (NIH/NLM, <http://www.ncbi.nlm.nih.gov/pubmed>) were performed by mid of 2014 for the years 2008 to 2013. Search strings used to identify hESC related papers were:

*human embryonic stem cell\*[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language]*

*human es cell\*[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language]*

*hesc[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language]*

*hes cell\*[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language]*

*human pluripotent stem cell\*[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language]*

*(embryonic stem cell\*[All Fields] OR es cell\*[All Fields]) AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms]) AND year[Publication Date] AND english[Language] AND (humans[MeSH Terms] OR human\*[TIAB])*

*pluripoten\*[All Fields] AND (stem cells[MeSH Terms] OR stem cell transplantation[MeSH Terms] OR stem cell\*[All Fields]) AND year[Publication Date] AND english[Language] AND (humans[MeSH Terms] OR human\*[TIAB])*

*year[Publication Date] AND (human embryonic stem cell\*[All Fields] OR human es cell\*[All Fields] OR hesc[All Fields] OR hes cell\*[All Fields] OR human pluripotent stem cell\*[All Fields]) AND english[Language]*

Search strings to identify hiPSC related papers were:

*induced pluripotent stem[All Fields] AND (Human [All Fields] OR Humans [All Fields]) AND year[Publication Date] AND English[Language]*

*("iPS cell"[All Fields] OR "iPS cells"[All Fields]) OR ("iPSC"[All Fields] OR "iPSCs"[All Fields]) AND (Human [All Fields] OR Humans [All Fields]) AND year[Publication Date] AND English[Language] NOT inhibitory postsynaptic current\*[All Fields] NOT "ips-1"[All Fields] NOT "immunoprecipitation (ips)"[All Fields]*

*("hiPSC"[All Fields] OR "hiPSCs"[All Fields]) AND year[Publication Date] AND English[Language]*

*Pluripotent Stem[All Fields] AND (Patient[All Fields] OR Patients[All Fields] OR Patient's[All Fields]) AND year[Publication Date] AND English[Language]*

*Pluripotent Stem[All Fields] AND(Human [All Fields] OR Humans [All Fields]) AND  
2013[Publication Date] AND English[Language]*

Hits were imported to EndNote and duplicate hits were removed. Initial searches resulted in 11,137 hits for hESC-related studies and 6,291 hits for hiPSC-related studies. Next, papers which were categorized by PubMed as non-research papers (biographies, comments, corrections, editorials, historical papers, interviews, news, reviews, retractions etc.) were excluded. Papers that appeared in journals that usually do not publish original experimental research involving human pluripotent stem cells (e.g. law and ethic journals, hypothesis journals and methodical and protocol journals that usually publish methodical reviews and previously published protocols) were also excluded. Abstracts and/or full texts of the remaining papers were inspected for the use of human ESCs and iPSCs, respectively, before they were added to the repositories. We did not include studies in which only pluripotent stem cell derived material (such as RNA) and cells (such as hiPSC derived or hESC derived neural progenitor cells) were used or that were solely based on pluripotent stem cell data obtained in previous research (such as expression data available from the GEO data base). Studies on stem cells from derived from human parthenogenetic entities were not included when hESCs were not used in the same study. Papers that were only pre-published in 2013 (but appeared in print in 2014) were not considered either. Paper selection resulted in a repository of 2,922 studies reporting experimental use of hESCs and 1376 studies reporting experimental use of hiPSCs. Please note that the publication year refers to the date at which the study was published in print (and not, for example, the online first publication date).

Allocation of a paper to a country was done according to the corresponding author's affiliation which was obtained from the full texts of the papers.

Numbers of hESC research papers published before 2008 (2000 to 2007) were taken from a previous publication (Löser et al., 2008).

#### *Determination of share of hESC and hiPSC papers in overall publication numbers from individual countries.*

To assess the extent of overall publication output from an individual country the Scopus database (<http://www.scopus.com>) was used since the PubMed data base does not allow for allocation of a study to a specific country without manual inspection of allocations. Searches of the Scopus database were restricted to the years 2008 to 2010 and 2011 and 2013, respectively, to the subject areas "life sciences" and "health sciences" and to the document types "article" and "letter". The share of hESC and hiPSC publications, respectively, in the overall publication number was determined by dividing the number of hESC/hiPSC

publications from the actual country for the years 2008 to 2010 or 2011-2013 by the number of overall publications from this country in the particular period of time.

### Citation Analysis

Citation analyses were performed in November 2014 using the Scopus database. 1999 hESC and 888 hiPSC research papers published from 2008 to 2012 were analysed for their overall citation frequencies through the end of 2013. Papers published in 2013 were omitted since for these papers reliable citation numbers for the year following their publication (2014) were not obtainable. For 18 hESC and 2 hiPSC papers, respectively, no citation frequency could be determined since the respective journals are not listed in the Scopus database. These papers were omitted from the analysis.

The average annual citation frequency of a paper was determined by dividing the number of citations by the number of years after the study was published (e. g. for a study that was published in 2008, numbers of citations from 2009 to 2013 were summated and divided by 5). Citations of a paper in the year of its publication were not considered. To determine the average citation number of studies from a certain country, average citation numbers for each paper from the respective country was summated and the sum was divided by the number of papers from this country.

To assess the share of papers that were cited at a certain citation number range, papers were allocated to three groups representing papers that were cited at a frequency of less than 50% of the average citation frequency (less than 5 times per year and paper for hESC research papers; less than 10 times per year and paper for hiPSC research papers), at a frequency between 50% and 150% of the average citation frequency (5 to 15 times per year and paper for hESC research papers; 10 to 30 times per year and paper for hiPSC research papers) or at a frequency of more than 150% of the average citation frequency (more than 15 times per year and paper for hESC research papers; less than 30 times per year and paper for hiPSC research papers), respectively.