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# Nobel Laureate Michael Morris Rosbash : A scientometric portrait

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## **Nobel Laureate Michael Morris Rosbash : A scientometric portrait**

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### **ABSTARCT**

Present Study analysis 201 publications (1972-2008) of Nobel laureate Jeffrey C Hall, an American eminent scientist in geneticist. His publications received 18,896 citations and first paper was reported in Scopus in 1972, subsequently, he published 200 research papers in various journals. The collaboration coefficient of scientist is 0.89 and forty-three (43) are two authored publications, 22 are single authored, scientist has authored highest publication in decade III (1990-1999) with 81(40.30%) publications. The paper entitled "A pdf neuropeptide gene mutation and ablation of PDF neurons each cause severe abnormalities of behavioral circadian rhythms in Drosophila" published in 'Cell' journal in 2000 has been cited highest 632 times with ranked 1 among all his publications. Study reveals out of 201 publications 193 (96.02%) papers are obtained all 18896 citations, and top 20(9.95%) publications are obtained 7566(40.04%) citations, and cited more than 200 times, scientist preferred 50 channel of

communications are used to publish his research output, most publications 28(13.93%) were published in 'Genetics' (IF: 4.556) journal.

**Keywords:** Scientometric, Jeffrey C Hall, Bibliometric, Scopus, Citation.

## **INTRODUCTION**

Individual scientists including the Nobel laureates are more and more becoming the focus of scientometric studies for quite some time.(Kalyane, V. L.; Sen, 1996), a good number of scientometric studies have been carried out on individual scientists from diverse subject backgrounds and disciplines. Scientometric analysis have been carried out on Nobel Laureates in various fields physics scientist, chemical scientist, chemist, agriculture scientist, nuclear scientist and so on (Kalyane and Kalyane, 1993; Gadad and Ravi, 2016; Hazarika, Sharma and Sen, 2010; Munnolli, Pujar and Kademani, 2011; Shinha, 2017; Kalyane and Kalyane, 1994; Konganurmah, Angadi and Kademani, 2004; Angadi et al., 2006; Kademani, Kalyane and Kumar, 2002; Vellaichamy and Amsan, 2016; Kademani, Sagar and Kumar, 2009; Dixit and Jange, 2017).

Scientometrics is concerned with the quantitative features and characteristics of science and scientific research. The term had gained wide recognition by the foundation in 1978 of the journal *Scientometrics* by Tibor Braun in Hungary and currently from Amsterdam. According to its subtitle, *Scientometrics* includes all quantitative aspects of the science of science, communication in science, and science policy (Wilson, 2001).

Bio-bibliometrics is a term that was first coined by Sen and Gan (1990) to mean the quantitative and analytical method for discovering and establishing functional relationships between bio-data and biblio-data elements. Bio-bibliometric is a study in which we statistically analyze publications of an individual, a department, or a subject of any field. It is a quantitative and analytical method in which we try to establish a functional relation between bio-data of an individual and his biblio-data. Mathematical and statistical techniques are used to study a publication's pattern, preferences, author's collaboration and chronological distribution of publications (Qayyum & Naseer, 2013). Kalyane and Kalyane (1993) first used the phrase 'Scientometric Portrait' to carry out bio-bibliometric studies on scientists. The present study centres on the contributions Jeffrey C. Hall, an American scientist, who won the Nobel Prize 2017 for Medicine for their discoveries of "molecular mechanisms controlling the circadian rhythms.

## **BIOGRAPHICAL SKETCH**

**Jeffrey C. Hall**, (born May 3, 1945, Brooklyn, New York) is well known American geneticist for his investigations of courtship behaviour and biological rhythms in the fruit fly *Drosophila melanogaster*. His research into molecular mechanisms underlying biological rhythm in the fruit fly helped scientists gain new insight into circadian rhythm, the self-regulating 24-hour biological clock that drives daily behavioral patterns in humans and other animals. For his research, he was awarded with the Nobel Prize in Physiology or Medicine in 2017 (shared with American scientists Michael Rosbash and Michael W. Young).

Hall grew up in Washington, D.C. He attended Amherst College in Massachusetts with studying medicine. Hall studied genetics at the University of Washington in Seattle, where he received Ph.D. in 1971. He subsequently pursued his postdoctoral research at the California Institute of Technology (CIT). In 1974 Hall became an assistant professor of biology at Brandeis University in Waltham, Massachusetts.

In 2004, after being named Emeritus Professor of Biology at Brandeis, Hall joined University of Maine as an associate professor, later he became Libra Professor of Neurogenetics. In addition to the Nobel Prize, Hall was awarded with various awards and honours during his career, including the Gruber Prize in Neuroscience (2009) and the Canada Gairdner International Award (2012), both are shared with Rosbash and Young.

## **SCOPE OF THE STUDY**

The study is covered the Jeffrey C. Hall's 201 publications (1972-2008) and citations received (1972-2017).

## **OBJECTIVES OF THE STUDY**

The main objectives of the study are:

- To find out the year-wise and age-wise distribution of authorship pattern;
- Decade-Wise Distribution of Publication of Jeffrey C. Hall;
- To know the most cited papers;
- To know the year-wise citations;
- To find out the Journals preferred by Jeffrey C. Hall; and
- To identify the prominent authors.

## **METHODOLOGY**

To conduct the study Scopus database was used to retrieve research output Jeffrey C. Hall. A total of 201 paper published by Jeffrey C. Hall during 1972-2017. The data obtained for study

from Scopus database on November 10, 2017 and then transferred into spread sheet application and analysed as per objectives of the study.

## RESULTS AND DISCUSSION

### YEAR-WISE AND AGE-WISE PUBLICATION PRODUCTIVITY OF JEFFREY C. HALL.

Jeffery C. Hall's first paper was reported in 1972 at the age of 27 in *Genetics*. He subsequently published 200 papers in various journals during 1973-2017. Categories of his publications published includes 166 Journal articles (82.6%), 16 Reviews (8.0%), 7 Erratum (3.5%), 4 Conference papers (2.0%), 4 Short Survey (2.0%), 2 Notes (1.0%), 1 Editorial (0.5%) and 1 Letter (0.5%). Table 1 indicates authorship pattern; it reveals highest number of literature is written by two authored 43(21.39%), followed by three authored and five authored 34(16.91%). Table 1 also indicate that scientist has published 22 single authored and 179 multi-authored papers. At biological age of scientist 46 and 55 his publications productivity was on peak (14) and the Collaboration Coefficient is 0.89.

**Table: 1 Year-wise and age-wise publication productivity of Jeffrey C. Hall between 1972-2017**

| Age of JCH | Year | Number of Papers under different Authorships |    |    |    |    |    |    |    |    |     |     |     |    |    | CT  | CC   | PP A |
|------------|------|--|----|----|----|----|----|----|----|----|-----|-----|-----|----|----|-----|------|------|
|            |      | 1A   | 2A | 3A | 4A | 5A | 6A | 7A | 8A | 9A | 10A | 11A | 17A | MA | TP |     |      |      |
| 27         | 1972 | 1  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | 1   | 1  | 2  | 2   | 0.50 | 1    |
| 28         | 1973 | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | -  | -  | -   | -    | 2    |
| 29         | 1974 | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | -  | -  | -   | -    | 3    |
| 30         | 1975 | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | -  | -  | -   | -    | 4    |
| 31         | 1976 | -  | 2  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | 2  | 2  | 4   | 1.00 | 5    |
| 32         | 1977 | 1  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | -  | 1  | 5   | 0.00 | 6    |
| 33         | 1978 | 2  | -  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | -  | 2  | 7   | 0.00 | 7    |
| 34         | 1979 | 1  | 3  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | 3  | 4  | 11  | 0.75 | 8    |
| 35         | 1980 | -  | 1  | 2  | 1  | -  | 1  | -  | -  | -  | -   | -   | -   | 5  | 5  | 16  | 1.00 | 9    |
| 36         | 1981 | -  | 2  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | 2  | 2  | 18  | 1.00 | 10   |
| 37         | 1982 | 1  | 1  | -  | -  | 1  | -  | -  | -  | -  | -   | -   | -   | 2  | 3  | 21  | 0.66 | 11   |
| 38         | 1983 | 1  | 1  | -  | 1  | -  | -  | -  | -  | -  | -   | -   | -   | 2  | 3  | 24  | 0.66 | 12   |
| 39         | 1984 | -  | 3  | -  | 2  | -  | -  | 2  | -  | -  | -   | -   | -   | 7  | 7  | 31  | 1.00 | 13   |
| 40         | 1985 | -  | 2  | 1  | -  | -  | -  | -  | -  | -  | -   | -   | -   | 3  | 3  | 34  | 1.00 | 14   |
| 41         | 1986 | 1  | 1  | 1  | -  | 1  | -  | -  | -  | -  | 1   | -   | -   | 4  | 5  | 39  | 0.80 | 15   |
| 42         | 1987 | -  | 6  | 1  | -  | 2  | 1  | 1  | -  | -  | -   | -   | -   | 11 | 11 | 50  | 1.00 | 16   |
| 43         | 1988 | -  | 2  | 5  | -  | 2  | -  | -  | -  | -  | -   | -   | -   | 9  | 9  | 59  | 1.00 | 17   |
| 44         | 1989 | -  | 3  | 3  | 2  | 1  | -  | 1  | -  | -  | -   | -   | -   | 10 | 10 | 69  | 1.00 | 18   |
| 45         | 1990 | 1  | 2  | 2  | 3  | -  | 1  | -  | -  | -  | -   | -   | -   | 8  | 9  | 78  | 0.89 | 19   |
| 46         | 1991 | 1  | -  | 1  | 1  | 1  | 1  | 1  | -  | -  | -   | -   | -   | 5  | 6  | 84  | 0.83 | 20   |
| 47         | 1992 | -  | 1  | 5  | 1  | 6  | 1  | -  | -  | -  | -   | -   | -   | 14 | 14 | 98  | 1.00 | 21   |
| 48         | 1993 | -  | 1  | 1  | 1  | 1  | -  | -  | -  | -  | -   | -   | -   | 4  | 4  | 102 | 1.00 | 22   |
| 49         | 1994 | 1  | 1  | -  | 1  | 4  | -  | -  | -  | -  | -   | -   | -   | 6  | 7  | 109 | 0.86 | 23   |
| 50         | 1995 | 1  | 1  | -  | -  | -  | -  | -  | -  | -  | -   | -   | -   | 1  | 2  | 111 | 0.50 | 24   |
| 51         | 1996 | 1  | 2  | 1  | -  | 3  | 2  | 1  | 1  | 1  | -   | -   | -   | 11 | 12 | 123 | 0.92 | 25   |
| 52         | 1997 | 1  | -  | 2  | 3  | 1  | 2  | -  | 1  | -  | -   | 1   | -   | 10 | 11 | 134 | 0.91 | 26   |
| 53         | 1998 | 2  | 3  | 1  | 1  | 4  | 1  | -  | 1  | -  | -   | -   | -   | 11 | 13 | 147 | 0.84 | 27   |
| 54         | 1999 | -  | 1  | -  | -  | 1  | -  | -  | 1  | -  | -   | -   | -   | 3  | 3  | 150 | 1.00 | 28   |
| 55         | 2000 | 1  | 2  | 3  | 2  | 2  | 3  | 1  | -  | -  | -   | -   | -   | 13 | 14 | 164 | 0.93 | 29   |

|                   |      |             |           |           |           |           |           |          |          |          |          |          |          |             |            |     |             |    |
|-------------------|------|-------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|----------|----------|-------------|------------|-----|-------------|----|
| 56                | 2001 | -           | 1         | 1         | 3         | 1         | -         | -        | 1        | -        | -        | 1        | -        | 8           | 8          | 172 | 1.00        | 30 |
| 57                | 2002 | 1           | -         | 1         | 7         | -         | -         | 1        | -        | -        | -        | -        | -        | 9           | 10         | 182 | 0.90        | 31 |
| 58                | 2003 | 2           | -         | 1         | -         | 2         | -         | -        | -        | -        | -        | -        | -        | 3           | 5          | 187 | 0.60        | 32 |
| 59                | 2004 | -           | -         | -         | 1         | -         | -         | -        | -        | -        | -        | -        | -        | 1           | 1          | 188 | 1.00        | 33 |
| 60                | 2005 | 1           | -         | -         | 2         | -         | 1         | -        | -        | -        | -        | -        | -        | 3           | 4          | 192 | 0.75        | 34 |
| 61                | 2006 | -           | -         | -         | 1         | -         | -         | -        | 2        | -        | -        | -        | -        | 3           | 3          | 195 | 1.00        | 35 |
| 62                | 2007 | 1           | -         | 2         | -         | -         | 1         | -        | -        | -        | -        | -        | -        | 3           | 4          | 199 | 0.75        | 36 |
| 63                | 2008 | -           | 1         | -         | -         | 1         | -         | -        | -        | -        | -        | -        | -        | 2           | 2          | 201 | 1.00        | 37 |
| 64                | 2009 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 38 |
| 65                | 2010 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 39 |
| 66                | 2011 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 40 |
| 67                | 2012 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 41 |
| 68                | 2013 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 42 |
| 69                | 2014 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 43 |
| 70                | 2015 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 44 |
| 71                | 2016 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 45 |
| 72                | 2017 | -           | -         | -         | -         | -         | -         | -        | -        | -        | -        | -        | -        | -           | -          | -   | -           | 46 |
| <b>Total</b>      |      | <b>22</b>   | <b>43</b> | <b>34</b> | <b>33</b> | <b>34</b> | <b>15</b> | <b>8</b> | <b>7</b> | <b>1</b> | <b>1</b> | <b>2</b> | <b>1</b> | <b>179</b>  | <b>201</b> |     | <b>0.89</b> |    |
| <b>Percentage</b> |      | <b>10.9</b> |           |           |           |           |           |          |          |          |          |          |          | <b>89.0</b> | <b>100</b> |     |             |    |
|                   |      | <b>5</b>    |           |           |           |           |           |          |          |          |          |          |          | <b>5</b>    |            |     |             |    |

Note: 1A= One Author, (2A-17A= Multiple Author (MA)), TP= Total Publication, CT= Cumulative Total, CC= Collaboration Coefficient, PPA= Publication Productivity Age

## DECADE-WISE DISTRIBUTION OF PUBLICATION OF JEFFREY C. HALL

Table 1a. Indicates decade-wise distribution of publication of scientist, the maximum number of publications of scientist were published in decades III (1990-1999), followed by decades II (1980-1989) and IV (2000-2009). He published very less papers in decades I (1980s).

Table.1a: Decade-wise Distribution of Publication of Jeffrey C. Hall

| Decade | Decade Period | No. of Publications | Percentage | Cumulative total | Publishing Career Age (Year: 1972) | Biological Age (DOB: 1945) |
|--------|---------------|---------------------|------------|------------------|------------------------------------|----------------------------|
| I      | 1970-1979     | 11                  | 5.47       | 11               | 1-9                                | 27-36                      |
| II     | 1980-1989     | 58                  | 28.85      | 69               | 10-19                              | 37-46                      |
| III    | 1990-1999     | 81                  | 40.30      | 150              | 20-29                              | 47-56                      |
| IV     | 2000-2009     | 51                  | 25.37      | 201              | 30-39                              | 57-66                      |
| V      | 2010-2017     | 0*                  | 0          | 201              | 40-49                              | 67-72                      |

\* There was no publication published during decade V (2010-2017)

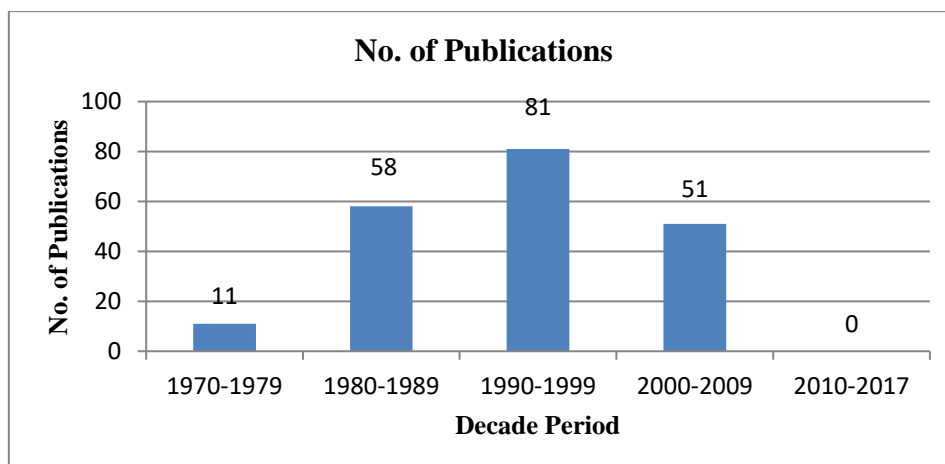


Fig .1 Decade-wise Distribution of Publication of Jeffrey C. Hall

Figure 1 revealed highest number of publications 81(40.30%) of J. C. Hall were published in Decade III (1990-1999) and no paper was published after decade IV (2000-2009), scientist last paper was published in 2008 (indicated in Table 1) at age 63, it might be age factor to decline in productivity of publication.

### HIGHLY CITED PAPER OF JEFFREY C. HALL

Table 2 shows twenty highly cited publications of Jeffrey C Hall which have received more than 200 citations during the period 1988-2008. The paper entitled “*A pdf neuropeptide gene mutation and ablation of PDF neurons each cause severe abnormalities of behavioral circadian rhythms in Drosophila*” published in ‘Cell’ journal in 1999 has received 632 citations with ranked one (1) among all his publications, followed by “*The cry(b) mutation identifies cryptochrome as a circadian photoreceptor in Drosophila*” published in ‘Cell’ Journal in 1998 has received 623 citations with ranked two(2). Study also focused majority of highly cited 6 papers have published in ‘Cell’ journal which citation and ranks are simultaneously 632 (Rank 1), 623 (Rank 2), 513 (Rank 4), 467 (Rank 6), 413 (Rank 8), 307 (Rank 11).

Table 2. Top 20 highly Cited paper of Jeffrey C. Hall

| Sl. No | Title of the Papers   | Year of Publication | Journal Name | No of Citations | Rank |
|--------|---|---------------------|--------------|-----------------|------|
| 1      | A pdf neuropeptide gene mutation and ablation of PDF neurons each cause severe abnormalities of behavioral circadian rhythms in <i>Drosophila</i> | 1999                | Cell         | 632             | 1    |
| 2      | The cry(b) mutation identifies cryptochrome as a circadian photoreceptor in <i>Drosophila</i>   | 1998                | Cell         | 623             | 2    |
| 3      | Feedback of the <i>Drosophila</i> period gene product on circadian cycling of its messenger RNA levels  | 1990                | Nature       | 621             | 3    |
| 4      | Cry, a <i>Drosophila</i> clock and light-regulated cryptochrome, is a major contributor to circadian rhythm resetting and photosensitivity        | 1998                | Cell         | 513             | 4    |
| 5      | Independent photoreceptive circadian clocks throughout <i>Drosophila</i>  | 1997                | Science      | 476             | 5    |

|    |   |      |                                  |     |    |
|----|---|------|----------------------------------|-----|----|
| 6  | A mutant <i>Drosophila</i> homolog of mammalian clock disrupts circadian rhythms and transcription of period and timeless   | 1998 | Cell                             | 467 | 6  |
| 7  | The mating of a fly   | 1994 | Science                          | 446 | 7  |
| 8  | Cycle is a second bHLH-PAS clock protein essential for circadian rhythmicity and transcription of <i>Drosophila</i> period and timeless   | 1998 | Cell                             | 413 | 8  |
| 9  | Segmental aneuploidy and the genetic gross structure of the <i>Drosophila</i> genome.   | 1972 | Genetics                         | 369 | 9  |
| 10 | Differential regulation of circadian pacemaker output by separate clock genes in <i>Drosophila</i>  | 2000 | Proc. Natl. Acad. Sci. U.S.A.    | 352 | 10 |
| 11 | Control of male sexual behavior and sexual orientation in <i>Drosophila</i> by the fruitless gene   | 1996 | Cell                             | 307 | 11 |
| 12 | Conditioned responses in courtship behavior of normal and mutant <i>Drosophila</i>  | 1979 | Proc. Natl. Acad. Sci. U.S.A.    | 302 | 12 |
| 13 | Circadian fluctuations of period protein immunoreactivity in the CNS and the visual system of <i>drosophila</i>   | 1990 | Journal of Neuroscience          | 293 | 13 |
| 14 | Neuroanatomy of cells expressing clock genes in <i>Drosophila</i> : Transgenic manipulation of the period and timeless genes to mark the perikarya of circadian pacemaker neurons and their projections | 2000 | Journal of Comparative Neurology | 273 | 14 |
| 15 | <i>Drosophila</i> CRY is a deep brain circadian photoreceptor   | 2000 | Neuron                           | 255 | 15 |
| 16 | Quantitative Analysis of <i>Drosophila</i> period Gene Transcription in Living Animals  | 1997 | Journal of Biological Rhythms    | 252 | 16 |
| 17 | Circadian rhythm mutations in <i>Drosophila melanogaster</i> affect short-term fluctuations in the male's courtship song  | 1980 | Proc. Natl. Acad. Sci. U.S.A.    | 246 | 17 |
| 18 | Expression of the period clock gene within different cell types in the brain of <i>Drosophila</i> adults and mosaic analysis of these cells influence on circadian behavioral rhythms                   | 1992 | Journal of Neuroscience          | 245 | 18 |
| 19 | The circadian clock of fruit flies is blind after elimination of all known photoreceptors   | 2001 | Neuron                           | 244 | 19 |
| 20 | Antibodies to the period gene product of <i>drosophila</i> reveal diverse tissue distribution and rhythmic changes in the visual system   | 1988 | Neuron                           | 237 | 20 |



## YEAR-WISE CITATION OF JEFFREY C. HALL'S PAPERS

Table 2a described year-wise citations of publications of Jeffrey C. Hall. The table indicates in 1972 he had not received any citation; author became citable in 1973 with eight (8) citations. The maximum number of citation 1026 has received in 2002 and total number of citation 18896 received till November 10, 2017.

**Table 2a: Year-wise Citation of Jeffrey C. Hall's Papers**

| S. No | Years | Citations | Cumulative Citations |
|-------|-------|-----------|----------------------|
| 1     | 1972  | 0         | 0                    |
| 2     | 1973  | 8         | 8                    |
| 3     | 1974  | 6         | 14                   |
| 4     | 1975  | 4         | 18                   |
| 5     | 1976  | 12        | 30                   |
| 6     | 1977  | 20        | 50                   |
| 7     | 1978  | 31        | 81                   |
| 8     | 1979  | 26        | 107                  |
| 9     | 1980  | 49        | 156                  |
| 10    | 1981  | 55        | 211                  |
| 11    | 1982  | 59        | 270                  |
| 12    | 1983  | 68        | 338                  |
| 13    | 1984  | 105       | 443                  |
| 14    | 1985  | 105       | 548                  |
| 15    | 1986  | 112       | 660                  |
| 16    | 1987  | 149       | 809                  |
| 17    | 1988  | 129       | 938                  |
| 18    | 1989  | 306       | 1244                 |
| 19    | 1990  | 256       | 1500                 |
| 20    | 1991  | 171       | 1671                 |
| 21    | 1992  | 213       | 1884                 |
| 22    | 1993  | 198       | 2082                 |
| 23    | 1994  | 418       | 2500                 |
| 24    | 1995  | 332       | 2832                 |
| 25    | 1996  | 491       | 3323                 |
| 26    | 1997  | 564       | 3887                 |
| 27    | 1998  | 794       | 4681                 |
| 28    | 1999  | 677       | 5358                 |
| 29    | 2000  | 860       | 6218                 |
| 30    | 2001  | 894       | 7112                 |
| 31    | 2002  | 1026      | 8138                 |
| 32    | 2003  | 955       | 9093                 |
| 33    | 2004  | 663       | 9756                 |
| 34    | 2005  | 969       | 10725                |

|    |      |     |       |
|----|------|-----|-------|
| 35 | 2006 | 741 | 11466 |
| 36 | 2007 | 918 | 12384 |
| 37 | 2008 | 861 | 13245 |
| 38 | 2009 | 742 | 13987 |
| 39 | 2010 | 644 | 14631 |
| 40 | 2011 | 676 | 15307 |
| 41 | 2012 | 731 | 16038 |
| 42 | 2013 | 748 | 16786 |
| 43 | 2014 | 653 | 17439 |
| 44 | 2015 | 512 | 17951 |
| 45 | 2016 | 479 | 18430 |
| 46 | 2017 | 466 | 18896 |

Fig .2 shown that the highest number of citations 1026 received in the year 2002.

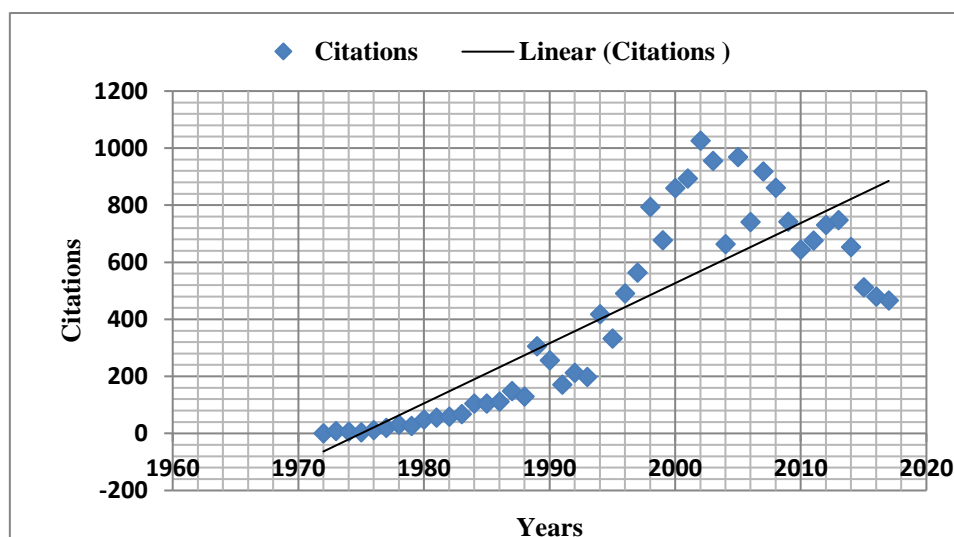


Fig .2 Year Wise Distribution of Publication Citations

Figure 2 shows Jeffrey C. Hall has received maximum 1026 citations in 2002, scientist has received total 18896 citations till date November 10, 2017.

### JOURNALS PREFERRED BY JEFFREY C. HALL

Table 2b indicate that Jeffrey C. Hall has been published 201 papers so far under fifty(50) renowned Journals in the field of sciences. He has published maximum 28 papers (rank 1) in genetics (with 4.556 IF) has received 1936 citation and its average citations of paper is 69.14 during FPY-LFY 1972-2007 followed by 18 papers (rank 2) in Journal of Neurogenetics (2.291 IF), 15 papers (rank 3) in Behavior Genetics (with 2.385 IF), 12 papers (rank 4) in Cell (with 30.41 IF), 11 papers (rank 5) in Journal of Biological Rhythms (with 3.5 IF), 11 papers (rank 5) in Journal of Journal of Neuroscience (with 5.988 IF), 11 papers (rank 5) in Neuron (with 14.024 IF), 11 papers (rank 5) in Proc. Natl. Acad. Sci. U.S.A. (with 9.661 IF), 9 papers (rank

6) in Nature. (With 40.137 IF), and so on, according to table 2b, 12 publication published in ‘Cell’ journal has received highest 3420 citations and its average citation of paper is 285, while highest impact factor journal preferred by Jeffrey C. Hall was Nature (IF 40.137).

**Table.2b: Journals Preferred by Jeffrey C. Hall for Publication and Citations in These Journals**

| S.No | Source  | IF     | No. of Papers | Rank | No. of Citations | Average Citations | FPY-LFY   |
|------|---|--------|---------------|------|------------------|-------------------|-----------|
| 1    | Genetics  | 4.556  | 28            | 1    | 1936             | 69.14             | 1972-2007 |
| 2    | Journal Of Neurogenetics                            | 2.291  | 18            | 2    | 607              | 33.72             | 1984-2008 |
| 3    | Behavior Genetics                                   | 2.385  | 15            | 3    | 824              | 54.93             | 1977-2000 |
| 4    | Cell  | 30.41  | 12            | 4    | 3420             | 285               | 1984-2001 |
| 5    | Journal Of Biological Rhythms                       | 3.5    | 11            | 5    | 971              | 88.27             | 1987-2002 |
| 6    | Journal Of Neuroscience                             | 5.988  | 11            | 5    | 1288             | 117.09            | 1987-2001 |
| 7    | Neuron  | 14.024 | 11            | 5    | 1442             | 131.09            | 1988-2001 |
| 8    | Proc. Natl. Acad. Sci. U.S.A.*                      | 9.661  | 11            | 5    | 1262             | 114.73            | 1979-2006 |
| 9    | Nature  | 40.137 | 9             | 6    | 1552             | 172.44            | 1984-2005 |
| 10   | EMBO Journal  | 9.792  | 5             | 7    | 391              | 78.2              | 1986-1997 |
| 11   | Science   | 37.205 | 5             | 7    | 1327             | 265.4             | 1986-2002 |
| 12   | Advances In Genetics                                | 5.431  | 4             | 8    | 333              | 83.25             | 1994-2008 |
| 13   | Animal Behaviour                                    | 2.869  | 4             | 8    | 234              | 58.5              | 1982-1989 |
| 14   | Current Biology                                     | 8.851  | 4             | 8    | 258              | 64.5              | 1991-2004 |
| 15   | Journal Of Neurobiology                             |        | 4             | 8    | 302              | 75.5              | 2000-2001 |
| 16   | Current Opinion In Neurobiology                     | 6.133  | 3             | 9    | 81               | 27                | 1998-2000 |
| 17   | Journal Of Comparative Neurology                    | 3.266  | 3             | 9    | 432              | 144               | 1980-2005 |
| 18   | Journal Of Insect Behavior                          | 0.970  | 3             | 9    | 175              | 58.33             | 1992-1994 |
| 19   | Annual Review Of Genetics                           | 8.745  | 2             | 10   | 125              | 62.5              | 1979-1990 |
| 20   | BMC Neuroscience                                    | 2.312  | 2             | 10   | 116              | 58                | 2002-2002 |
| 21   | BMC Neuroscience Electronic Resource                |        | 2             | 10   | 153              | 76.5              | 2002-2002 |
| 22   | Development   | 5.843  | 2             | 10   | 107              | 53.5              | 1989-1991 |
| 23   | Developmental Genetics                              |        | 2             | 10   | 119              | 59.5              | 1983-1994 |
| 24   | Journal Of Insect Physiology                        | 2.227  | 2             | 10   | 260              | 130               | 1980-1981 |
| 25   | Journal Of Molecular Evolution                      | 2.434  | 2             | 10   | 26               | 13                | 1992-1993 |
| 26   | Trends In Neurosciences                             | 11.124 | 2             | 10   | 235              | 117.5             | 1986-1995 |
| 27   | Advances In Insect Physiology                       | NA     | 1             | 11   | 54               | 54                | 1990-1990 |
| 28   | Annual Review Of Neuroscience                       | 15.63  | 1             | 11   | 40               | 40                | 1988-1988 |
| 29   | Basic Life Sciences                                 |        | 1             | 11   | 13               | 13                | 1980-1980 |
| 30   | Biochemical Society Transactions                    | 2.765  | 1             | 11   | 1                | 1                 | 1991-1991 |
| 31   | Bioessays   | 4.441  | 1             | 11   | 4                | 4                 | 1987-1987 |
| 32   | Biological Cybernetics                              | 1.716  | 1             | 11   | 8                | 8                 | 1992-1992 |
| 33   | Cell And Tissue Research                            | 2.787  | 1             | 11   | 32               | 32                | 1996-1996 |
| 34   | Cold Spring Harbor Symposia On Quantitative Biology |        | 1             | 11   | 4                | 4                 | 2007-2007 |
| 35   | Developmental Biology                               | 2.944  | 1             | 11   | 86               | 86                | 1976-1976 |
| 36   | Discussions In Neuroscience                         |        | 1             | 11   | 8                | 8                 | 1992-1992 |
| 37   | Gene  | 3.6    | 1             | 11   | 97               | 97                | 1996-1996 |
| 38   | Genes and Development                               | 9.413  | 1             | 11   | 104              | 104               | 1988-1988 |
| 39   | Integrative And Comparative Biology                 | 2.382  | 1             | 11   | 1                | 1                 | 1992-1992 |

|    |  |        |     |    |     |     |           |
|----|--|--------|-----|----|-----|-----|-----------|
| 40 | Journal Of Comparative Physiology A  | 0      | 1   | 11 | 0   | 0   | 1979-1979 |
| 41 | Journal Of Comparative Physiology A Neuroethology Sensory Neural And Behavioral Physiology | 2.492  | 1   | 11 | 14  | 14  | 2006-2006 |
| 42 | Journal Of Membrane Biology  | 1.696  | 1   | 11 | 5   | 5   | 1993-1993 |
| 43 | Learning Memory Cold Spring Harbor N Y   |        |     | 11 | 16  | 16  | 1995-1995 |
| 44 | Methods In Enzymology  |        | 1   | 11 | 42  | 42  | 2005-2005 |
| 45 | Plos Biology   | 9.797  | 1   | 11 | 167 | 167 | 2003-2003 |
| 46 | Quarterly Reviews Of Biophysics  | 5.267  | 1   | 11 | 125 | 125 | 1982-1982 |
| 47 | Results And Problems In Cell Differentiation   |        | 1   | 11 | 21  | 21  | 1978-1978 |
| 48 | Trends In Ecology And Evolution  |        | 1   | 11 | 3   | 3   | 1990-1990 |
| 49 | Trends In Genetics   | 10.844 | 1   | 11 | 23  | 23  | 1987-1987 |
| 50 | Zeitschrift Fur Naturforschung Section C Journal Of Biosciences                            | 1.432  | 1   | 11 | 25  | 25  | 1981-1981 |
|    |  |        | 201 |    |     |     |           |

\*Proceeding of the National Academic of Sciences of the United States of America

## PROMINENT AUTHORS JEFFREY C. HALL'S PUBLICATIONS $\geq 6$ TIMES

Table 3 represents research team of Jeffrey C. Hall. Scientist has worked with 179 collaborators in his productive career and produced as many as 58 papers in collaboration with M. Rosbash who is found to be the most productive collaborator of Jeffrey C. Hall. There are about a ½ dozen other collaborators with whom he has produced more than 10 papers.

**Table: 3 - Prominent Authors Jeffrey C. Hall's Publications  $\geq 6$  Times**

| Rank | Authors                            | Total No of papers |
|------|------------------------------------|--------------------|
| 1    | Rosbash, M.                        | 58                 |
| 2    | Kyriacou, Charalambos Panayiotis   | 23                 |
| 3    | Villella, Adriana                  | 18                 |
| 4    | Stanewsky, Ralf                    | 16                 |
| 5    | Gailey, Donald A.                  | 14                 |
| 6    | Dowse, Harold B.                   | 12                 |
| 7    | Taylor, Barbara Jackson            | 10                 |
| 7    | Hamblen-Coyle, Melanie J.          | 10                 |
| 8    | Wheeler, David A.                  | 9                  |
| 8    | Tompkins, Laurie                   | 9                  |
| 9    | Peixoto, Alexandre Afr nio Peixoto | 8                  |
| 9    | Hardin, Paul E.                    | 8                  |
| 9    | Levine, Joel D.                    | 8                  |
| 9    | Lee, Gyunghee                      | 8                  |
| 10   | Kaneko, Maki                       | 7                  |
| 10   | Brandes, Christian                 | 7                  |
| 10   | Siegel, Richard W.                 | 7                  |
| 10   | Park, Jae                          | 7                  |

|    |                      |   |
|----|----------------------|---|
| 10 | Kay, Steven          | 7 |
| 10 | Funes, Pablo         | 7 |
| 10 | Baker, Bruce S.      | 7 |
| 11 | Rutila, Joan E.      | 6 |
| 11 | Zwiebel, Laurence J. | 6 |
| 11 | Kulkarni, Shankar J. | 6 |
| 11 | Konopka, Ronald J.   | 6 |
| 11 | Plautz, Jeffrey D.   | 6 |

## CONCLUSION

Jeffrey C. Hall's Publication productivity under study for 46 years (1972-2017) during which he has published 201 papers indicate that the productivity increased in decades III (1990-1999). He has published 22 single authored papers and 179 with collaboration and its collaboration coefficient was 0.89. His highly cited paper was "*A pdf neuropeptide gene mutation and ablation of PDF neurons each cause severe abnormalities of behavioral circadian rhythms in Drosophila*" published in 'Cell' journal in 1999 has received citation 632, maximum citation received (1026) year was 2002 in a year, he has published his papers in more than 50 renowned journals which have high impact factor, and he has published 240 papers in collaboration. M. Rosbash who is found to be the most productive collaborator of Jeffrey C. Hall.

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