

Are CSIR–UGC NET-qualified Junior Research Fellows going away from science?

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Data pertaining to CSIR-supported Junior Research Fellows (JRFs) indicate that around 41% of the students qualifying CSIR–UGC NET, conducted from December 2008 to June 2010, did not avail of the fellowships offered. The present study reveals that not availing the CSIR-JRF is attributed primarily to awardees' preference to go abroad for higher studies; or to take up jobs in academic and R&D institutes; or to avail of fellowships offered by other funding agencies. Furthermore, a sizeable percentage of NET-qualified students availed of the fellowship by clearing NET again. Only a small percentage of NET-qualified students opt for a career in non-scientific institutes. Therefore, the concerns that NET-qualified students are going away from science are unfounded.

Keywords: Enrollment, Junior Research Fellowships, National Eligibility Test.

THE Council of Scientific and Industrial Research (CSIR) started a research fellowship scheme in 1983 to identify young scientific talent through National Eligibility Test (NET) for pursuing Ph D in academic and scientific institutions across India. The award of Junior Research Fellowships (JRFs) through NET is being shared with the University Grants Commission (UGC) since 1986. Further, NET was recognized by UGC as an eligibility for Lectureship in 1989, and the examination was renamed as CSIR–UGC National Eligibility Test for Junior Research Fellowship and Eligibility for Lectureship.

NET is conducted twice a year in June and December in five subject areas of basic sciences, viz. chemical; earth, ocean and planetary; life; mathematical and physical Sciences. From 2012, amendments have been made in the NET scheme with regard to qualification and validity of CSIR-JRF to widen the scope of NET and to attract students at early stages of their career. The validity to avail JRF has been increased to two years and students with BS-four-year programme/B E/B Tech/B Pharm/MBBS/Integrated BS–MS/MSc or equivalent degree, B Sc (Hons) or equivalent degree can take NET. Further, to augment the number of Ph Ds in engineering, 'engineering sciences' has been introduced as a 6th subject from December 2012. Age limit for writing JRF–NET is 28 years, whereas there is no age limit for NET–Lectureship. A five-year age relaxation is given to candidates belonging to Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), Physically

handicapped (PH) category and women candidates. SC, ST and OBC candidates are also provided fee benefits to apply for CSIR–UGC NET.

Over the years, the number of candidates registering for CSIR–UGC NET for JRF and eligibility for lectureship has increased significantly¹. Data pertaining to undergraduate (UG) and postgraduate (PG) enrollment for the period 2004–05 to 2009–10 indicate that the number of students enrolled for UG and PG courses in science has been increasing with an average annual growth of 8% and 19% respectively. The increase in growth in enrollment at UG and PG levels in science in 2009–10 over 2004–05 is reported to be 44% and 121% respectively (Table 1)². Thus, increase in registration over the years for CSIR–UGC NET is in tandem with the increase in enrollment in UG and PG courses in science.

During 2011–12, a total of 4274 fellowships were awarded through CSIR–UGC NET and out of these, 2135 fellowships were passed on to UGC for support. The biggest beneficiary of NET is the university system and the national laboratories, including those of CSIR, the Departments of Biotechnology, Science and Technology, Atomic Energy, etc. where majority of these students join. CSIR–UGC NET has been instrumental in strengthening the pool of highly qualified S&T manpower in the country over the years.

Efforts are being made to increase the number of fellowships awarded through CSIR–UGC NET. During the 11th Five-Year Plan (2007–12), the number of fellowships offered by CSIR has increased twofold over the 10th Five-Year Plan (2002–07). It has, however, been observed that, on an average about 41% of the candidates awarded the CSIR-JRF did not avail of the fellowship offered through NET conducted during the period

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Table 1. Year-wise enrollment of students in B Sc and M Sc during 2004–05 to 2009–10

Financial year	B Sc enrollment	M Sc enrollment	% M Sc enrollment of B Sc enrollment	B Sc (% yearly increase in enrollment)	M Sc (% yearly increase in enrollment)
2004–05	1,490,785	198,719	13	–	–
2005–06	1,578,652	219,285	14	6	10
2006–07	1,643,998	249,071	15	4	14
2007–08	1,805,920	388,542	22	10	56
2008–09	2,000,374	382,619	19	11	–2
2009–10	2,148,956	439,725	20	7	15
Yearly average growth (%)				8	19
Percentage of increase in growth rate in 2009–10 over 2004–05				44	121

Source: Ref. 2.

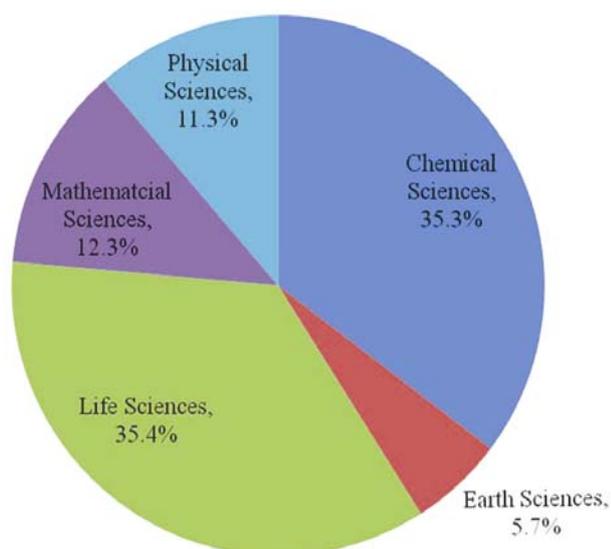


Figure 1. Subject-wise break-up of CSIR-JRF (6096) awarded through CSIR-UGC NET conducted from December 2008 to June 2010.

December 2008 to June 2010. There are apprehensions that the CSIR-JRFs who did not avail of the fellowship are probably going away from science. The present study was undertaken to ascertain the actual reasons for not availing of the CSIR-JRF awarded through CSIR-UGC NET.

Methodology

Data pertaining to CSIR-JRF awarded through CSIR-UGC NET conducted during December 2008, June 2009, December 2009 and June 2010, and the number of fellowships availed of have been taken from the Extramural Research Division (EMR-I) of Human Resource Development Group, CSIR. A feedback proforma, designed to ascertain the reason(s) for not availing of the CSIR-JRF, was sent by post or e-mailed to the candidates (2517) who did not avail of the fellowship. A total of 844 (34%) responses received have been analysed to ascertain the reason(s) for not availing of the fellowship.

Results

Subject-wise award of CSIR-JRF vis-à-vis rank-wise joining

CSIR awarded a total of 6096 fellowships through CSIR-UGC NET conducted from December 2008 to June 2010. About 35.4% of the fellowships awarded was in the area of life sciences, 35.3% in chemical sciences, 12.3% in mathematical sciences, 11.3% in physical sciences and 5.7% in earth sciences (Figure 1).

Out of 6096 fellowships awarded in all disciplines together, 41% (2517) of CSIR-JRF did not avail of the fellowships. Analysis of the discipline-wise data revealed that 56% of the candidates who qualified NET under mathematical sciences did not avail a fellowship followed by physical and earth sciences (49% each), life sciences (38%) and chemical sciences (36%; Table 2).

Though 59% of CSIR-JRFs actually availed of the fellowship awarded through CSIR-UGC NET conducted from December 2008 to June 2010 (Table 2), the subject-wise overall joining was highest (64%) in chemical sciences, followed by life sciences (62%), earth sciences and physical sciences (51% each) and lowest in mathematical sciences (44%; Table 3).

Rank-wise analysis of CSIR-JRF revealed that the overall joining gradually increased from 45% (rank ≤ 50) to 70% (rank 200–250) and then decreased (Table 3). Subject-wise joining up to the rank 50 was highest in chemical sciences (54%), followed by life sciences (49%), earth sciences (48%), physical sciences (38%) and the lowest in mathematical sciences (35%). The subject-wise joining pattern of the top-100 ranking JRFs was similar to that of the top 50, with highest joining in chemical sciences (59%), followed by life sciences (55%), earth sciences (51%), physical sciences (45%), and lowest in mathematical sciences (42%).

Subject-wise analysis of NET qualified candidates who did not avail of the fellowships

Out of a total of 2517 NET-qualified candidates who did not avail of the CSIR-JRFs awarded through NET

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Table 2. Examination-wise number of Junior Research Fellowships awarded by CSIR and number of JRFs who did not avail of the fellowship

NET examination	Subject-wise number of CSIR-JRFs awarded						Number of JRFs who did not avail of the fellowship					
	Chemical sciences	Earth sciences	Life sciences	Mathematical sciences	Physical sciences	Total	Chemical sciences	Earth sciences	Life sciences	Mathematical sciences	Physical sciences	Total
December 2008	663	83	617	207	217	1787	200	35	210	112	90	647
June 2009	575	72	597	231	214	1689	210	30	218	123	95	676
December 2009	425	142	493	121	212	1393	168	70	184	78	127	627
June 2010	492	52	449	191	43	1227	195	37	204	106	25	567
Total	2155	349	2156	750	686	6096	773 (36.0)	172 (49.0)	816 (38.0)	419 (56.0)	337 (49.0)	2517 (41.0)

Figures in parenthesis represent the percentage of JRFs who did not avail of the fellowship.

Table 3. Ranking pattern of cumulative subject-wise CSIR-JRFs awarded through NET conducted from December 2008 to June 2010 vis-à-vis JRFs availed

Ranking	Subject-wise number of CSIR-JRFs awarded						Number of JRFs who availed the fellowship					
	Chemical sciences	Earth sciences	Life sciences	Mathematical sciences	Physical sciences	Total	Chemical sciences	Earth sciences	Life sciences	Mathematical sciences	Physical sciences	Total
≤ 50	235	194	216	211	196	1052	126	94	106	74	74	474 (45.0)
51–100	270	116	269	214	181	1050	172	65	162	105	97	601 (57.0)
101–150	328	11	332	167	186	1024	213	4	205	76	104	602 (59.0)
151–200	361	28	417	128	68	1002	232	14	265	59	42	612 (61.0)
201–250	373	–	363	7	32	775	246	–	276	4	18	544 (70.0)
251–300	274	–	291	13	23	601	202	–	179	8	14	403 (67.0)
301–350	58	–	99	10	–	167	46	–	55	5	–	106 (63.0)
351–400	86	–	96	–	–	182	56	–	52	–	–	108 (59.0)
401–450	85	–	73	–	–	158	48	–	40	–	–	88 (56.0)
451–500	81	–	–	–	–	81	39	–	–	–	–	39 (48.0)
>500	4	–	–	–	–	4	2	–	–	–	–	2 (50.0)
Total	2155	349	2156	750	686	6096	1382 (64.0)	177 (51.0)	1340 (62.0)	331 (44.0)	349 (51.0)	3579 (59.0)

Figures in parenthesis represent the percentage of JRFs who availed of the fellowship.

conducted during the period December 2008 to June 2010, 844 (34%) responded and indicated their option for not availing of the fellowship. Subject-wise distribution pattern of respondents (844) indicates that life sciences constitutes 34% of the total respondents, chemical sciences 25%, mathematical sciences 18%, physical sciences 16% and earth sciences 7%. However, the response percentage was maximum (41%) in physical sciences followed by earth, life and mathematical sciences (35% each) and the least in chemical sciences (28%; Table 4).

Varied reasons have been given by the respondents for not availing of the JRF awarded by CSIR. Out of the total respondents (844), 27% opted for the fellowships offered by other funding agencies. Around 20% were selected for (a) teaching positions in universities or its affiliated graduate/postgraduate colleges and (b) permanent/temporary positions as scientist/researcher in government/public/private R&D organizations. A sizeable percentage (19) has gone abroad in pursuit of higher education. Only 6% of the total respondents have joined Central/State

Table 4. Subject-wise distribution of JRFs contacted who did not avail of the fellowship and the number of feedbacks received

Subject	No. of JRF feedback proforma mailed	No. of feedbacks received	Percentage of feedbacks received
Chemical sciences	773	213 (25)	28
Earth sciences	172	60 (7)	35
Life sciences	816	285 (34)	35
Mathematical sciences	419	148 (18)	35
Physical sciences	337	138 (16)	41
Total	2517	844	34

Figures in parenthesis represent the relative percentage.

Table 5. Subject-wise distribution of respondents and reasons for not availing of the CSIR-JRF

Reason(s) for not availing of the CSIR-JRF	Subject-wise number of respondents					Total responses received
	Chemical sciences	Earth sciences	Life sciences	Mathematical sciences	Physical sciences	
Fellowships from other funding agencies	20	13	89	42	60	224 (27.0)
Selected for teaching position in university/graduate, postgraduate colleges	25	1	15	36	6	83 (10.0)
Gone abroad for higher education	56	7	64	13	18	158 (19.0)
Selected for permanent/temporary position as scientist/researcher in government/public/private R&D organization	22	11	22	6	25	86 (10.0)
Employment in non-scientific organization	18	16	5	9	6	54 (6.0)
Joined by clearing another NET	45	4	48	11	9	117 (14.0)
Personal/health/family reasons	8	5	9	3	4	29 (3.5)
Not interested in Ph D and pursuing M Tech, etc.	5	3	10	10	9	37 (4.0)
Teaching in secondary/senior secondary schools, etc.	4	0	6	8	0	18 (2.0)
Not found a suitable laboratory	4	0	9	3	1	17 (2.0)
Other (exact reason not mentioned)	6	0	8	7	0	21 (2.5)
Total	213	60	285	148	138	844

Figures in parenthesis represent relative percentage of response received.

Administrative/Armed Services or got employment in non-scientific organizations. Many of the students write NET time and again to improve their rank so as to be eligible for the Shyama Prasad Mukherjee Fellowship (SPMF), a high-end fellowship awarded by CSIR to certain top-ranking NET-qualified candidates. It is interesting to note that 14% of the fellows had actually availed of the CSIR-JRF by clearing NET again.

The subject-wise analysis of the reasons for not availing of the CSIR-JRFs is given in Table 5. In chemical sciences, 26% of 213 fellows who did not avail of the CSIR-JRF, have gone abroad for higher studies, 22% took up jobs in academic and R&D institutes, and only 9% availed of the fellowships awarded by other funding agencies. In earth sciences, 27% of 60 fellows, who did not avail of the CSIR-JRF, got employment in non-scientific organizations, 22% availed of fellowships awarded by other funding agencies, 20% took up jobs in academic and R&D institutes, and 12% have gone abroad for higher studies. In life sciences, 31% of 285 fellows who did not avail of the CSIR-JRF actually availed of fellowships awarded by other funding agencies, 22% have

gone abroad for higher studies and 13% took up jobs in academic and R&D institutes. In mathematical sciences, 30% of 148 fellows who did not avail of the CSIR-JRF, took up jobs in academic and R&D organizations, 28% availed of fellowships awarded by other funding agencies and 9% have gone abroad for higher studies. In physical sciences, 43% of 138 fellows, who did not avail of the CSIR-JRF, actually availed of fellowships awarded by other funding agencies, 22% took up jobs in academic and R&D institutes and 13% have gone abroad for higher studies.

Subject-wise analysis of the CSIR-NET JRF further revealed that out of 158 respondents who had gone abroad for pursuing higher studies, maximum were from life sciences (41%) followed by chemical sciences (35%; Table 5). Out of 224 respondents who availed of the fellowships awarded by other funding/sponsoring agencies, maximum were from life sciences (40%) followed by physical sciences 27%. Twenty-six per cent of 86 respondents selected for 'permanent/temporary positions as scientist/researcher in Government/public/private R&D organizations', were from chemical and life sciences

each. Forty-three per cent of 83 respondents selected for teaching positions in universities/graduate, postgraduate colleges, were from mathematical sciences followed by chemical sciences (30%) and life sciences (18%). Further, 33% of 54 respondents who got employment in non-scientific organizations were from chemical sciences (Table 5).

Apart from CSIR, a number of funding agencies under various Ministries/Departments are providing research fellowships for pursuing doctoral research. Prominent among these are Department of Biotechnology (DBT), Department of Atomic Energy (DAE), UGC, Department of Science and Technology (DST), Indian Council of Medical Research (ICMR), Ministry of Human Resource Development (MHRD), National Board for Higher Mathematics (NBHM) and Indian Council of Agricultural Research (ICAR). Our results have shown that, out of 224 respondents who had been awarded fellowships by other funding agencies, maximum (17.0%) were supported by DBT, followed by UGC (14.8%), DAE (12.0%), ICMR (7.9%), DST (6.9%), NBHM (6.5%) and MHRD (6.0%).

Conclusion

An increase in the enrollment of students for UG and PG courses in science during the period 2004–05 to 2009–10

is accompanied by significant increase in registration for CSIR–UGC NET for JRF and Eligibility for Lectureship. Majority of CSIR–UGC NET-qualified fellows who did not avail of the CSIR-JRF, remained in the science stream and have been pursuing doctoral research with the fellowships provided by other funding/sponsoring agencies, or pursuing research in foreign institutes, or are employed in academic and R&D institutes. Thus, our results dispelled the concern that NET-qualified candidates who did not avail of the CSIR-JRF are going away from science. India, however, still requires a large number of highly skilled S&T personnel to compete in the knowledge-driven global economy. Efforts should be made to progressively augment the creation of high-quality skilled human resource at all levels, starting from inculcating scientific temper at school level to creating better and competitive job opportunities.

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