



YENEPOYA

(DEEMED TO BE UNIVERSITY)

Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

Details of the Collaborative Activity

2020-21

Name of the Collaborating Institute: Bhabha Atomic Research Centre (BARC), Mumbai.

Name of collaborating department from YDU: Yenepoya Research Center and Department of Oral Pathology, Yenepoya Dental College

Activities:

Joint Research Projects ongoing

Collaborative joint research activities were undertaken with Bhabha, Atomic Research Centre (BARC), Mumbai, India, by Dept. of Oral Pathology, Yenepoya Dental College and Yenepoya Research Center.

1. Assessment of cellular and molecular changes in response to thoron inhalation in mice
Collaborators: Dr. Bipasha Bose (PI), Dr. Sudheer Shenoy (Co-PI), Dr. Sahoo BK, Dr. Nagesh Bhat (2017-2021)

Joint Research publications

1. Kudkuli J, Agrawal A, Gurjar OP, Sharma SD, Rekha PD, Manzoor MA, Singh B, Rao BS, Abdulla R. Demineralization of tooth enamel following radiation therapy; An in vitro microstructure and microhardness analysis. *J Can Res Ther.* 2020;16(3):612-618.
2. Chaudhury D, Sen U, Bhat NN, Sahoo BK, Shenoy S, Bose B. Lung damage by thoron progenies versus possible damage redemption by lung stem cells a perspective. *International Journal of Radiation Biology.* 2020

ATTESTED

- Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Derlakatte
Mangalore- 575 015, Karnataka

Please Distribute to the Addressees as Marked (-)



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Dr. Debanik Roy
Programme Officer (NRFCC)

BRNS Secretariat, 1st Floor,
CC, BARC, Trombay,
Mumbai-400085 Phone:
+91-2225593946
Fax: 2225593946
Email: deroy@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36124

Date: 12/01/2017

OFFICE MEMORANDUM

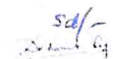
Sub: R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018. bearing sanction 36(4)/14/51/2016-BRNS with NRFCC, BRNS.

On the recommendations of the Board of Research in Nuclear Sciences (BRNS), I am pleased to convey the administrative approval and sanction of the President of India for the captioned project for **3 years** beginning from financial year 2016-2017 with a total grant of **Rs.42,21,900/- (Rupees forty two lakh twenty one thousand nine hundred only)** for the project as under :

Item of expenditure	Year 1 (2016-2017)	Year 2 (2017-2018)	Year 3 (2018-2019)
Equipments*	420000	200000	100000
Staff Salary - JRF	300000	300000	336000
Consumables	900000	750000	200000
Travel - PI	50000	25000	25000
Contingencies	25000	25000	25000
Overheads	125250	95625	49575
Total(INR)	1820250	1395625	735575


Note: * Ammonia sensors, Portable radiation detection monitor for radiation safety, Smart Rn Duo Portable Radon/Thoron monitor, Thoron exposure chamber
JRF salary calculated @25,000/- p.m. for first two years and on redesignation by committee on in third year as SRF @ 28,000/- p.m. RA salary calculated @ 36,000/- p.m.
Overheads calculated @ 7.5% of the other heads except contingency. The remaining 7.5% towards overheads (Rs. 2,70,450/-) shall be released only on meeting the requirements specified (See Annex-B).

- I am also pleased to convey the sanction of the President of India to incur an expenditure of **Rs. 18,20,250/- (Rupees eighteen lakh twenty thousand two hundred fifty only)** towards grant for the year 2016-2017 .
- The expenditure involved is debit to: **04 3401 00 004 27 0231**.
- This issues with the concurrence of Scientific Secretary, BRNS and IFA.


Dr. Debanik Roy

Pay & Accounts Officer, DAE, Mumbai - 400 001.

ATTESTED


Dr. Gangadhar Gontayaji K.S.
Registrar
Yenepoya(Deemed to be University)
University Road, Derlakatte
Mangalore- 575 018, Karnataka

Copy forwarded to:

1. Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001.
2. Joint Secretary (R&D), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001.
3. Registrar, Yenepoya University, Mangalore, Karnataka, 575018.
4. Principal Investigator(PI): Dr. Bipasha Bose, Yenepoya Research Centre, Yenepoya University, Mangalore, Karnataka, 575018..

A. First year grant is being released in full along with this Sanction Letter through Pay & Accounts Officer, Department of Atomic Energy, Anushakti Bhavan, CSM Marg, Mumbai-400 001 directly. You may await a Money transfer (MT) through ECS and The amount would be credited electronically to A/C No: 113206021000020, A/C Name: Yenepoya University, IFSC: VIJB0001132, Vijaya Bank, LHH Road, Founders Branch, Mangalore-575 001 .

i) Acceptance of this sanction and the MT for the amount sanctioned for the first financial year may please be acknowledged (Form-I).

ii) THIS SANCTION IS FURTHER SUBJECT TO THE CONDITIONS STIPULATED IN ANNEX (ENCLOSED), WHICH MAY BE GONE THROUGH CAREFULLY.

B. Second year Sanction Letter will be issued automatically in the month of April/May of the 2nd financial year, however, the grant will be released (unspent balance of previous year and Interest earned will be adjusted) after the PI submits the following documents to the Programme Officer NRFCC:

a) Claim in Form-II quoting the reference of the sanction issued for the first year.

b) Utilisation Certificate (UC) as on 31st March of the preceding financial year in Form-III duly audited by the Internal Auditor of the University/ Institution or a Chartered Accountant.

c) Statement of Accounts (SA) as on 31st March of the preceding financial year should be updated on the website. Interest earned in previous year should be reflected in the Statement of Accounts. A printout of the same should be sent to BRNS after it is duly audited by the Internal Auditor of the University/ Institution or a Chartered Accountant.

d) Copy of appointment order and joining report of the staff appointed for the project along with minutes of the Selection Committee, should be uploaded in a single pdf file under the file head "Staff Appointment Details". In addition, the details of the appointed staff should also be updated in the available menu.

e) The inventory of equipment also should be updated in the menu, besides uploading the purchase order of the items costing more than 1 Lakh.

f) A One Page report on the progress of work during first year.

C. Third and subsequent years (if any) the Sanction Letter and the grant will be released on fulfillment of the following requirements:

i) Renewal/ Extension Application: Principal Investigator (PI) is required to upload by January 15 a pdf copy of duly signed renewal/ extension application in the prescribed form-(PRA) after logging into his/her account at www.daebrns.gov.in. All applications received shall be examined by experts from the field and PIs may be invited to a Technical Programme Discussion Meeting (TPDM). Renewal of the project will be based on the recommendations of the TPDM, Advisory Committee and the Board.

ii) Sanction Letter: If the progress is found to be satisfactory the renewal sanction for the year will be issued in the beginning of that financial year in April/May.

iii) Claim: On receipt of the renewal sanction, the PI shall claim the funds sanctioned by submitting the following documents to Programme Officer NRFCC, BRNS Secretariat, First Floor, Central Complex, BARC, Trombay, Mumbai-400 085:

a) Claim in Form-II quoting reference of the renewal sanction.

b) Utilisation Certificate (UC) as on 31st March of the preceding financial year in Form-III duly audited by the Internal Auditor of the University/ Institution or a Chartered Accountant. should be reflected in the Statement of Accounts.

c) Statement of Accounts (SA) as on 31st March of the preceding financial year including the amount of Interest earned in previous year and duly audited by the Internal Auditor of the University/ Institution or a Chartered Accountant.

d) Copy of appointment order and joining report of the staff appointed for the project along with minutes of the Selection Committee.

e) An inventory of equipment and the copy of Purchase order of equipments costing more than 1 Lakh.

D. At the end of Terminal Year the Settlement Grant and the Balance 7.5% Overheads will be released on

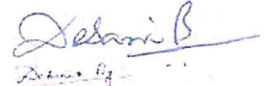
ATTESTED

Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore- 575 018, Karnataka

fulfillment of the following requirements:

- a) Claim Form-II if any,
 - b) The final Consolidated Statement of Accounts (SA) and Consolidated Utilization Certificate duly audited by an external Chartered Accountant or the Statutory (Govt.) Auditor. It is mandatory to include the amount of bank interest earned on the grant released into the SA.
 - c) Final Consolidated Progress Report and a brief report as per format given in Form-VII .
5. AAO (Cheque), DAE, Anushakti Bhavan, CSM Marg, Mumbai - 400 001 – With a request that the amount granted for the first year of the project may be released.
 6. Member Secretary (NRFCC) : Dr. Vivekanand Kain, viykain@barc.gov.in; Ph:+91-2225595067
 7. Co-Investigator (CI) : Dr Sudheer Shenoy, shenoy2000@yahoo.com, Mobile :9922470992
 8. Project Collaborator (PC): Dr Nagesh N Bhatt, Biosimet.Lab,Radiol Phy and Adv Div, BARC,Mumbai, Email : nageshnb@barc.gov.in, Mobile :9619508188Dr. B.K Sahoo, Radiol.Phy and Adv Div BARC, Mum 400 085, Email : bijaybarc@gmail.com, Mobile :9323811738


You or your nominee may please be the DAE representative for selection of Research Fellow/ Research Associate for the project.


Dr. Debanik Roy

Note:

1. Please quote the Sanction Number 36(4)/14/51/2016-BRNS in all your correspondence with BRNS

ATTESTED


Dr.Gangadhar Somayaji K.S.
Registrar
Yenepoya(Deemed to be University)
University Road, Deraikatte
Mangalore- 575 010, Karnataka

Dr. Bipasha

2nd yr grant



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Shri Dhananjay G Parulekar
Programme Officer (NRFCC)

BRNS Secretariat, 1st Floor, CC, BARC, Trombay,
Mumbai-400085. Phone: +91-25591140
Email: pdhag@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36066

Date: 01/08/2018

OFFICE MEMORANDUM

Sub: Revalidation of R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018. bearing sanction 36(4)/14/51/2016-BRNS with NRFCC, BRNS.

In continuation of this Department's OM 36(4)/14/51/2016-BRNS dated 12/01/2017, on the recommendations of the Board of Research in Nuclear Sciences (BRNS), I am pleased to convey the administrative approval and sanction of the President of India to revalidate the sanction of Rs. 18,20,250/- (Rupees eighteen lakh twenty thousand two hundred fifty only) from the year 2016-2017 to 2017-2018.

2. The other Terms and Conditions of the sanction letter of even number dated 12/01/2017 will remain unchanged.
3. This is issued with the concurrence of the competent authority in the Department.

Shri Dhananjay G Parulekar

Pay & Accounts Officer, DAE, Mumbai - 400 001.

Copy forwarded to:

1. Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001
2. Joint Secretary (R&D), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001.
3. Registrar, Yenepoya University, Mangalore, Karnataka, 575018..
4. Principal Investigator(PI): Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018.
5. AAO (Cheques II), DAE, Anushakti Bhavan, CSM Marg, Mumbai - 400 001
6. Member Secretary (NRFCC) : Dr. Vivekanand Kain, yivkain@barc.gov.in; Ph:+91-2225595067
7. Co-Investigator (CI) : Dr Sudheer Shenoy, Yenepoya Res Centre, Yenepoya Univ, Mangalore, Email : shenoy2000@yahoo.com, Mobile :9922470992
8. Departmental Co-ordinator(DC)/PC : Dr Nagesh N Bhatt, Biosimet.Lab,Radiol Phy and Adv Div, BARC,Mumbai, Email : nageshnb@barc.gov.in, Mobile :9619508188Dr. B.K Sahoo, Radiol.Phy and Adv Div BARC, Mum 400 085, Email : bijaybarc@gmail.com, Mobile :9323811738

ATTESTED

Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya(Deemed to be University)
University Road, Deralakatte
Mangalore- 575 018, Karnataka



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Shri Dhananjay G Parulekar
Programme Officer (NRFCC)

BRNS Secretariat, 1st Floor, CC,
BARC, Trombay, Mumbai-400085.
Phone: +91-25591140
Email: pdhag@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36066

Date: 01/08/2018

OFFICE MEMORANDUM

Sub: R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018. bearing sanction 36(4)/14/51/2016-BRNS with NRFCC, BRNS.

In continuation of this Department's OM of even number dated 12/01/2017 on the recommendations of the Board of Research in Nuclear Sciences (BRNS), I am pleased to convey the administrative approval of the President of India for the continuance of captioned project during 2018-2019 and sanction to incur an expenditure of Rs. 13,95,625/- (Rupees thirteen lakh ninety five thousand six hundred twenty five only) as detailed below:

Item of expenditure	Year 2 (2018-2019)
Equipments	200000
Staff Salary - JRF (1)	300000
Consumables	750000
Travel - PI	25000
Contingencies	25000
Overheads	95625
Total(INR)	1395625

2. The grant remaining unspent under the Heads "Equipments", "Consumables" and "Overheads" for the year 2017-2018 are only allowed to be carried forward to the current financial year 2018-2019. Unspent balance under other heads will be adjusted while releasing the subsequent grant.
3. The expenditure involved is debitible to the following Head of Account: 3401 00 004 27 02 31
4. This is issued with the concurrence of the competent authority in the Department.

Sd/-
Shri Dhananjay G Parulekar

Pay & Accounts Officer, DAE, Mumbai-400 001

Copy forwarded to:

1. Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001.

ATTESTED

Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore, Karnataka



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Shri Dhananjay G Parulekar
Programme Officer (NRFCC)

BRNS Secretariat, 1st Floor, CC,
BARC, Trombay, Mumbai-400085.
Phone: +91-25591140
Email: pdhag@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36066

Date: 01/08/2018

OFFICE MEMORANDUM

Sub: R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018. bearing sanction 36(4)/14/51/2016-BRNS with NRFCC, BRNS.

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Item of expenditure	Year 2 (2018-2019)
Equipments	200000
Staff Salary - JRF (1)	300000
Consumables	750000
Travel - PI	25000
Contingencies	25000
Overheads	95625
Total(INR)	1395625

- The grant remaining unspent under the Heads "Equipments", "Consumables" and "Overheads" for the year 2017-2018 are only allowed to be carried forward to the current financial year 2018-2019. Unspent balance under other heads will be adjusted while releasing the subsequent grant.
- The expenditure involved is debitible to the following Head of Account: 3401 00 004 27 02 31
- This is issued with the concurrence of the competent authority in the Department.

Sd/-

Shri Dhananjay G Parulekar

Pay & Accounts Officer, DAE, Mumbai-400 001

Copy forwarded to:

- Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001.

ATTESTED

Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore- 575 018, Karnataka

Bank Name & Branch	VIJAYA BANK Yenepoya University Branch, Yenepoya University Campus, Derlakatte, Mangalore-575018, Karnataka
IFSC/RTGS Code	VIJB0001827
Email id of A/C Holder	financeofficer@yenepoya.org
Email id of PI	Bipasha.bose@gmail.com

11. The institute will furnish to the SERB, New Delhi, separate Utilization certificate (UCs) financial year wise to the SERB for Recurring (Grants-in-aid General) & Non-Recurring (Grants for creation of capital assets) and an audited statement of accounts pertaining to the grant immediately after the end of each financial year.

12. The institute will maintain separate audited accounts for the project. A part or whole of the grant must be kept in an interest earning bank account which is to be reported to SERB. The interest thus earned will be treated as credit to the institute to be adjusted towards further installment of the grant.

13. The project File no. EMR/2017/003114 may also be mentioned in all research communications arising from the above project with due acknowledgement of SERB.

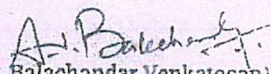
14. The manpower sanctioned in the project, if any is co-terminus with the duration of the project and SERB will have no liability to meet the fellowship and salary of supporting staff if any, beyond the duration of the project

15. As this is the first grant being released for the project, no previous U/C is required.

16. The institute may refund any unspent balance to SERB by means of a Demand Draft favoring "FUND FOR SCIENCE AND ENGINEERING RESEARCH" payable at New Delhi.

17. The organization/institute/university should ensure that the technical support/financial assistance provided to them by the Science & Engineering Research Board, a statutory body of the Department of Science & Technology (DST), Government of India should invariably be highlighted/ acknowledged in their media releases as well as in bold letters in the opening paragraphs of their Annual Report.

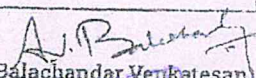
18. In addition, the investigator/host institute must also acknowledge the support provided to them in all publications, patents and any other output emanating out of the project/program funded by the Science & Engineering Research Board, a statutory body of Department of Science & Technology (DST), Government of India.

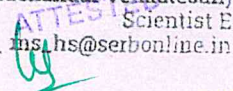

(Dr. Balachandar Venkatesan)
Scientist E
ms_bs@serbonline.in

To,
Under Secretary
SERB, New Delhi

Copy forwarded for information and necessary action to:-

1.	The Principal Director of Audit, A.G.C.R. Building, IIIrd Floor I.P. Estate, Delhi-110002
2.	Sanction Folder, SERB, New Delhi.
3.	File Copy
4.	Dr. Bipasha Bose Yenepoya Research Centre Yenepoya University, University road, deralakatte, mangalore, karnataka, Mangalore, Karnataka-575018 Email: Bipasha.bose@gmail.com Mobile: 919449806403 Dr. Undurti N Das BioScience Research Centre B Gayatri Vidya Parishad College Of Engineering (Autonomous) Dr. Sudheer P Shenoy Yenepoya Research Centre Yenepoya University (Start date of the project may be intimated by name to the undersigned. For guidance, terms & Conditions etc. Please visit www.serb.gov.in .)
5.	Registrar, Yenepoya University, University Road, Deralakatte, Mangalore, Karnataka (Receipt of Grant may be intimated by name to the undersigned)


(Dr. Balachandar Venkatesan)
Scientist E
ms_bs@serbonline.in


Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakattu
Mangalore-575 018, Karnataka

To YRC file
17/02/2020

Received on
10th March 2020
to YU a/c



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Dr Ajay Kumar
Programme Officer (HLC)

BRNS Secretariat, 316-C, CFB,
BARC, Trombay, Mumbai-400085.
Phone: +91-02225595399
Email: pdhag@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36318

Date: 14/02/2020

OFFICE MEMORANDUM

Sub: Terminal grant-in aid for the year 2019-2020, for the R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka -575018 bearing sanction 36(4)/14/51/2016-BRNS with HLC, BRNS.

In continuation of this Department letter of even number dated 01/08/2018, on the recommendations of the Board of Research in Nuclear Sciences (BRNS), I am pleased to convey the administrative approval of the President of India for the continuance of captioned project during 2019-2020 and sanction to incur an expenditure of Rs. 9,14,075/- (Rupees nine lakh fourteen thousand seventy five only) as detailed below:

Item of expenditure	Year 3 (2019-2020)
Equipments	100000
Staff Salary - JRF	420000
Consumables	200000
Travel - PI	25000
Contingencies	25000
Overheads	55875
HRA (period - 01.04.2019 to 31.03.2020)	67200
Salary Arrears (01.04.2019 to 31.03.2020)	21000
Total(INR)	914075

Date of Termination of the Project : 31/03/2020.

- The grant remaining unspent under the Heads "Equipments" for the year 2018-2019 is allowed to be carried forward to the current financial year 2019-2020.
- The expenditure involved is debitible to the following Head of Account: 04 3401 00 004 27 02 31
- This is issued with the concurrence of the competent authority in the Department.

[Signature]
14.2.2020
Dr Ajay Kumar

Pay & Accounts Officer,
DAE, Mumbai - 400 001.

ATTESTED

[Signature]
Dr. Gangadhara Somayaji K.S.
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore- 575 018, Karnataka



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Dr Ajay Kumar
Programme Officer (HLC)

BRNS Secretariat, 316-C,
CFB, BARC, Trombay,
Mumbai-400085 Phone:
+91-02225595399
Email: pdhag@barc.gov.in

No: 36(4)/14/51/2016-BRNS/36319

Date: 14/02/2020

Sub: Forwarding of bill/s to Accounts

Bill No	DATE	Amount	In Favour of
36124	14/02/2020	Rs.907746/-	A/C No: 113206021000021, A/C Name: Yenepoya University, IFSC: VIJB0001132, Vijaya Bank, LHH Road, Founders Branch, Mangalore-575 001
Assesment of cellular and molecular changes in response to thoron inhalation in mice under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018., bearing sanction 36(4)/14/51/2016-BRNS with HLC, BRNS.			
Grant Sanctioned for the year 2018-2019 Rs. 9,14,075/- (Rupees nine lakh fourteen thousand seventy five only) (including HRA sanction for Rs. 67200/-)			
(-) Unspent Balance (note 2) Rs. 6329/-			
Bill Amount Rs. 907746/-			
Note: 1. Allowed to carry forward unspent balance under 'equipment' of 2018-2019 to 2019-2020. 2. Adjusted Unspent balance of 2018-19 under heads Travel- Rs. 266/- & Interest - Rs. 6063/- i.e. Total Rs. 6329/-.			

Encl: Bill/s.

Dr Ajay Kumar

Assistant Accounts Officer, Cheque, DAE

1. Registrar, Yenepoya University, Mangalore, Karnataka, 575018..
2. Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018.
3. Member Secretary (HLC) : Shri. Mahesh Subramanian, maheshs@barc.gov.in;
4. Principal Collaborator (PC): Dr Nagesh N Bhatt, Biodosimet. Lab, Radiol Phy and Adv Div, BARC, Mumbai,

ATTESTED

Dr. Gangadhara Somayaji K.S.
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Copy forwarded to:

1. Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001.
2. Joint Secretary (R&D), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001. rd2@dae.gov.in
3. Registrar, Yenepoya University, Mangalore, Karnataka - 575018.
4. Principal Investigator(PI): Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka - 575018.

A. In accordance with Rule 30 of the General Financial Rules 2005, this sanction will lapse if no payment in whole or part is made during a period of twelve months from the date of issue of this sanction letter.

B. Grant for the terminal year will be released in FULL (unspent balance of previous year and Interest earned will be adjusted) on receipt of the CLAIM IN DUPLICATE in prescribed FORM-II along with the following documents. The data for these documents are required to be filled online and a printout of the same should be forwarded to the undersigned after obtaining original signatures of the concerned officials.

- (a) Utilization Certificate for the preceding year.
- (b) Statement of Accounts signed by Internal Auditor/ Accountant of the Institution/ University for the preceding year. Interest earned in previous year should be reflected in the Statement of Accounts.
- (c) Copy of appointment order and joining report of the staff appointed for the project along with Minutes of the Selection Committee.
- (d) An inventory of equipment including copy of the Purchase order.

C. PLEASE NOTE THAT CLAIM(S) SHALL BE SUBMITTED TO THIS DEPARTMENT WELL IN ADVANCE BEFORE THE END OF THE FINANCIAL YEAR IN WHICH THE CLAIM IS DUE. OTHERWISE, THE SANCTIONED GRANT WILL BE LAPSE.

D. The balance of Overhead grant shall be released after on receipt of the CLAIM in duplicate in prescribed FORM-II along with the following documents within 6 months from the date of termination of the project:

- (1) Consolidated AUDITED Statement of Accounts from a Statutory Auditor (Govt. Auditor) or a Chartered Accountant for the grant-in-aid paid during the previous years (Form-IV).
- (2) AUDITED Utilization Certificate to the effect that grant received during the years were utilized for the purpose for which they were sanctioned.
- (3) An inventory of equipment in An inventory of equipment, including copy of the Purchase orders.
- (4) Three hard copies of the final consolidated Project Completion Report (PCR).
- (5) Uploading of soft copy of the PCR and two page brief report through the website.

E. If the claims are not received within the stipulated period, it will be presumed that the Investigator has no further claim, and the file will be closed.

F. The grant remaining unutilized, if any, may be refunded vide DD drawn in favour of "Pay & Accounts Officer, DAE, Mumbai" and sent to BRNS Secretariat alongwith documents listed at para (D) above. The unutilized grant may be refunded in whole rupees by rounding off the amount to the nearest rupee.

G. Attention is also invited to the procedure regarding publication of papers (vide para 9 of the Annexure to the "Terms and Conditions" already sent to you alongwith first year sanction letter), the above has been classified as Unreserve for the purpose of the publication of results of the work.

5. AAO (Cheque), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001
6. Member Secretary (HLC) : Shri. Mahesh Subramanian, maheshs@barc.gov.in;
7. Co-Investigator (CI): Dr Sudheer Shenoy, Yenepoya Res Centre, Yenepoya Univ, Mangalore, Email : shenoy2000@yahoo.com, Mobile :9922470992
8. Principal Collaborator (PC): Dr Nagesh N Bhatt, Biodosimet.Lab,Radiol Phy and Adv Div, BARC,Mumbai, Email : nageshnb@barc.gov.in, Mobile :9619508188 Dr. B.K Sahoo, Radiol.Phy and Adv Div BARC, Mumbai 85, Email : bijaybarc@gmail.com, Mobile :9323811738

Dr Ajay Kumar

Note:

1. Please quote the Sanction Number 36(4)/14/51/2016-BRNS in all your correspondence with BRNS.
2. All the forms mentioned in the sanction letter and the terms & conditions are also available on the website. Kindly update Statement of Accounts, details of Equipment and staff in the menu available on the leftside when viewapplication is clicked. The renewal/extension forms and scanned copy of duly signed financial documents (SA,UC & claim) also needs to be uploaded to get grant for subsequent years. Kindly verify that the data given in your profile is correct.
3. Please note that as per the government orders under Direct Benefit Transfer (DBT) scheme, the staff salary has to be transferred to his/her bank account. Accordingly, Aadhar Number(UID) of the appointed staff, Bank Account details and the Mobile number linked to the bank account should be obtained and it should be intimated to this office.

ATTESTED

Dr. Gangadhar Semayaji K.S.
Registrar
Yenepoya Deemed to be University
University Road, Deralakatte
Mangalore- 575 018, Karnataka



Government of India
Department of Atomic Energy (DAE)
Board of Research in Nuclear Sciences (BRNS)

Dr Ajay Kumar
Programme Officer (HLC)

BRNS Secretariat, 316-C, CFB,
BARC, Trombay, Mumbai-400085.

No: 36(4)/14/51/2016-BRNS/36069

Date: 23/07/2020

OFFICE MEMORANDUM

Sub: Extension with grant-in-aid for the year 2020-2021 R/P entitled "Assesment of cellular and molecular changes in response to thoron inhalation in mice" under Dr. Bipasha Bose, Yenepoya Research centre, Yenepoya University, Mangalore, Karnataka, 575018. bearing sanction 36(4)/14/51/2016-BRNS with HLC, BRNS.

In continuation of this Department's OM of even number dated 17/06/2020, on the recommendations of the Board of Research in Nuclear Sciences (BRNS), I am pleased to convey the administrative approval of the President of India, for the continuance and extension of the captioned project upto 28.02.2021 with additional financial assistance as given below:-

Staff Salary	Rs. 385000/-
Overhead	Rs. 28875/-
Total	Rs. 413875/-

2. Accordingly, the project will get terminated on 28.02.2021.
3. The other Terms and Conditions of the sanction letter dated 17/06/2020 will remain unchanged.
4. This is issued with the concurrence of the competent authority in the Department.

Ashok K. Pandey
23.7.2020

Ashok K. Pandey
Programme Officer
Board of Research in Nuclear Sciences,
Department of Atomic Energy,
BRNS Secretariat, 3rd Floor, CFB
BARC, Trombay, Mumbai - 400085

Pay & Accounts Officer, DAE, Mumbai - 400 001.

Copy forwarded to:

1. Director of Audit, Scientific Department, AEAP, OYC, CSM Marg, Mumbai-400 001.
2. Joint Secretary (R&D), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001.
3. Registrar, Yenepoya University, Mangalore, Karnataka, 575018.
4. Principal Investigator (PI): Dr. Bipasha Bose, Yenepoya University, Mangalore, Karnataka, 575018..
5. AAO (Cheque), DAE, Anushakti Bhavan, CSM Marg, Mumbai-400 001.
6. Co-Investigator (CI): Dr Sudheer Shenoy, Yenepoya Res Centre, Yenepoya Univ, Mangalore, .
7. Member Secretary (HLC): Shri. Dr Amit Kumar, amitk@barc.gov.in
8. Principal Collaborator (PC): Dr Nagesh N Bhatt, Biodosimet Lab, Radiol. Phy and Adv Div, BARC, Mumbai, Email : nageshnb@barc.gov.in, Mobile :9619508188 Dr. B.K Sahoo, Radiol. Phy and Adv Div BARC, Mum 400 085, Email : bijaybarc@gmail.com, Mobile :9323811738.

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Original Article

Dr Jagadish Kudkuli

Demineralization of tooth enamel following radiation therapy; An *in vitro* microstructure and microhardness analysis

Jagadish Kudkuli,
Ashish Agrawal¹,
Om Prakash
Gurjar²,
Sunil Dutt
Sharma^{3,4},
P. D. Rekha,
Muhammed A. P.
Manzoor,
Balwant Singh¹,
B. S. Rao,
Riaz Abdulla⁵

ABSTRACT

Objective: The objective of this study is to evaluate the effects of radiotherapy doses on mineral density and percentage mineral volume of human permanent tooth enamel.

Materials and Methods: Synchrotron radiation X-ray microcomputed tomography (SR μ CT) and microhardness testing were carried out on 8 and 20 tooth samples, respectively. Enamel mineral density was derived from SR μ CT technique using ImageJ software. Microhardness samples were subjected to Vickers indentations followed by calculation of microhardness and percentage mineral volume values using respective mathematical measures. Data were analyzed using paired *t*-test at a significance level of 5%. Qualitative analysis of the enamel microstructure was done with two-dimensional projection images and scanned electron micrographs using μ CT and field emission scanning electron microscopy, respectively.

Results: Vickers microhardness and SR μ CT techniques showed a decrease in microhardness and an increase in mineral density, respectively, in postirradiated samples. These changes were related to mineral density variation and alteration of hydroxyapatite crystal lattice in enamel surface. Enamel microstructure showed key features such as microporosities and loss of smooth homogeneous surface. These indicate tribological loss and delamination of enamel which might lead to radiation caries.

Conclusions: Tooth surface loss might be a major contributing factor for radiation caries in head-and-neck cancer patients prescribed to radiotherapy. Such direct effects of radiotherapy cause enamel abrasion, delamination, and damage to the dentinoenamel junction. Suitable measures should, therefore, be worked out to protect nontarget oral tissues such as teeth while delivering effective dosages to target regions.

KEYWORDS: Head-and-neck cancer, microhardness, radiotherapy, SR μ CT, tooth enamel

INTRODUCTION

Oral squamous cell carcinoma is the sixth most common cancer reported globally, with an annual incidence of over 3,000,000 cases of which 62% arise in developing countries.^[1] Vital head-and-neck (H and N) anatomy and severe metastasis of affected squamous epithelial tissues are serious challenges for successful implementation of radiation which is a principal mode of H and N cancer treatment to improve the tumor control probability of target areas. However, the focus has become increasingly prominent to reduce normal tissue complication probability that is likely to occur on normal tissues surrounding the target. This has led to rapid advancements in technology and delivery methods of radiotherapy which has opened up preferences between ⁶⁰Co gamma-rays and high-energy X-rays (typically 6 megavoltage [MV] X-rays from

medical electron linear accelerators [LINACs]) among various other upgraded systems. Notwithstanding such developments, the severity of oral sequelae continues to persist, affecting quality of life (QOL) of H and N cancer patients. The high ionization potential of MV radiation and maximum fractions of radiation dose administered to oral tumor cells are the major factors for indirect side effects induced upon salivary gland damage such as mucositis, xerostomia, taste loss, trismus, and direct side effects such as progressive loss of periodontal ligament, osteoradionecrosis, and radiation caries.^[2]

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Lung damage by thoron progenies versus possible damage redemption by lung stem cells: a perspective

Debajit Chaudhury, Utsav Sen, Nagesh N Bhat, Bijay Kumar Sahoo, Sudheer Shenoy P & Bipasha Bose

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Lung damage by thoron progenies versus possible damage redemption by lung stem cells: a perspective

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Running title: Thoron inhalation, lung damage and redemption

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Keywords: Thoron, Ionizing Radiation, Lung stem cells, Oxidative damage, Repair mechanisms

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