量子科学技術研究開発機構量子医科学研究所**HIMAC**利用研究課題申請書　（　　年度）

Proposal for Research Project at QST-**HIMAC** (FY )

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| \*1課題整理番号Project No. |  | □所内利用／共同研究Collaborative Research□有償利用　□成果を公開する有償利用Paid Use　　Paid Use to publish results | 年　　月　　日Date(yy/mm/dd) 　 　 |
| \*2分類Category | □新規　□継続2年目　□継続3年目　□4年目新規 New 2nd year 3rd year 4th year | □治療・診断　□生物　□物理・工学Clin & Diag Biology Physics |
| 研究課題名Title of Research Project |  |
| \*3課題申請者Spokesperson | 氏名Name | Last/First/M | 職名Title |  |
| 所属機関名、部署名Institution |  |
| 住所　〒Address |  |
| 電話 phone: |  | fax: |  |
| e-mail: |  |
| \*4 共同研究者Co-researcher at QST | 氏名Name |  | 所属部課Division |  | 内線 ext. |
| 研究の目的と意義 Objective of Project |  | \*5 想定している研究年数Assumed years of research |  |
|  |
| MTに関する希望Beam Time Request | 加速粒子Particle | エネルギーEnergy (MeV/u) | 強度又は線量率Intensity | 日数又は時間Hours Requested | ビームコースBeam Line |
| 1: HIMAC生物照射室(Bio)2: HIMAC中エネ照射室(Mid-Energy) |
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| \*4研究分担者List of Participants(Last/First/M) | 氏名Name | 所属Institution | 職名Title | 量研での身分Status at QST |
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**日本語又は英語で書かれた「研究計画詳細」を添付すること。**

\*1量研機構側で使用するので記入しないこと。\*2該当するものにチェック。\*3課題申請者は量研機構との事務連絡も担当する。\*4 **機構外の方が共同研究の一環で課題申請する場合、記載は必須です。機構内課題で外部機関の人が研究分担者に入る場合、来所の有無にかかわらず共同研究契約等の締結は必須です。** \*5「研究計画詳細」の「2．研究計画」中に根拠を必ず記載してください。

Additional information should be presented on separate sheets in either Japanese or English.

\*1 Office use only. \*2 Check categories. \*3 All correspondence will be sent to the spokesperson. \*4 Required if used for collaborative research. \*5 This rationale must be included in the “Details of the Proposal” section “2. Experimental Methods”.

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| **安全性及び実験遂行に必要な手続きの確認****Safety Issues and Special Requirements** |
| 申請する内容に該当する項目にチェックを入れ、その詳細と対策/手続きについて数行にまとめて記載して下さい。記入する際は青字部を消してから記入してください。 |
| なお、本申請書で申請されていない場合、下記に該当する実験は実施できません。 |
| Please check the boxes that apply to what you are applying for and describe the details and measures/procedures in a few lines. When filling out the form, please delete the blue text before filling in the form. If this application is not submitted with this form, the following experiments cannot be conducted. |
|  |  |  |  |
| 　 | 項目 | 実施 | 詳細及び安全対策　Details and safety measure |
| 共通Common items | 標準条件外Out of standard operation | 　□ | 提供条件以外の条件での実験を計画されている場合は、詳細、及びQSTの共同研究者との打合せ状況を記載してください。If you plan to conduct experiments under conditions other than those provided, please describe details and the status of meetings with your collaborator in QST. |
| 高線量照射High dose irradiation | 　□ | 同一サンプルに対して1000Gy以上照射を予定している場合には、取り扱いに関する安全対策を記載してください。If you plan to irradiate more than 1000 Gy to the same sample, please describe the safety measures for handling. |
| 照射試料の持出Carrying out of irradiated materials | 　□ | 照射したターゲット、細胞、動物などを管理区域から搬出する計画があるときは、放射線レベルについての見積もりを記述してください。放射化した状態の物品を搬出する場合は事前に放射線安全課と協議する必要があります。If you plan to carry out targets, cells, animals, etc. from the radiation-controlled area after irradiation, please describe your estimate of radioactivity levels. |
| 有害物質（毒劇物、農薬等）Toxic Substances | 　□ | 有害物質の利用を予定されている場合は、使用予定の薬剤名、入手方法（持ち込み/QST千葉地区内研究者からの分与）、安全対策・廃棄方法について記載してください。If you plan to use toxic substances, please describe the name of the chemical, how to obtain it, those safety measures, and disposal methods. |
| 　 | 　 | 　 | 　 |
| 生物Biology | 動物実験Animals | 　□ | 動物の種類the type of animal： 入手手段How to get it?:□持込Bring-your own, □QSTで購入Buy at QST□未定not determined, □その他Other, details: QSTへの申請Application to QST：　□Done/□Yet実施体制Implementation Structure(QST千葉地区以外の方):  |
| 遺伝子組換え実験Genetically modified organism | 　□ | □P1/□P1A/□P1P/□P2/□P2A/□KO by genome editing 詳細Details:　　　　　　　　　　　QSTへの申請Application to QST：　□Done/□Yet実施体制Implementation Structure(QST千葉地区以外の方): 　　　　　  |
| ヒトサンプルHuman-derived experimental materials | 　□ | 詳細Detail of the sample: QSTへの申請Application to QST：　□Done/□Yet所属機関の承認Approval from your institution：　□Done/□Yet実施体制Implementation Structure(QST千葉地区以外の方):  |
| 微生物実験Microbiological Experiments | 　□ | □BSL1/□BSL2微生物の種類the type of microorganism： QSTへの申請Application to QST：　□Done/□Yet実施体制Implementation Structure(QST千葉地区以外の方):  |
| 向神経薬Neurotropic drugs | 　□ | 薬品名Drug name: 入手手段How to get it?:□持込Bring-your own, □分与from QST staff, name: □未定not determined, □その他Other, details:  |
| その他Others | 　□ | 生物系実験でリスクが想定される事項があれば、その詳細と安全対策について記載してください。Please describe any other possible risks and safety measures for them. |
| 　 | 　 | 　 | 　 |
| 物理・化学系Physics/Chemistry | ガスGas | 　□ | 使用するガスの種類、想定される危険性とその安全対策について記載してください。Please describe the size and weight of heavy equipment and the method of carrying in and out. |
| その他Others | 　□ | 物理系・化学系実験でリスクが想定される事項があれば、その詳細と安全対策について記載してください。（例）重量物の搬入、搬出Please describe any other possible risks and safety measures. e.g. Carrying in and out heavy objects. |

　生物照射室内で使用できる電源

Power supply available in Bio-irradiation room

3φ3W　210V　2箇所（配電盤） switchboard, 2 locations

1φ3W　210/105V　2箇所（配電盤） switchboard, 2 locations

100V　2個口4箇所（コンセント） type A, 2 sockets, 4 locations

　生物照射室に搬入できる荷物の上限

Freight elevator: Must be used for carrying heavy items into Bio-irradiation room

 重量　500kg weight limit

 寸法　900mm×1100mm×1180mm dimension limit

**INSTRUCTIONS FOR PREPARATION OF**

**“DETAILS OF THE PROPOSAL”**

Directions

Provide information relevant to “Details of the Proposal” using the following format:

\* Information should be typed on A4-size white paper.

\* The name of a spokesperson should be typed in the margin of the upper-right corner.

\* The length of the document should be 6 pages or less, including figures and tables.

\* Because black-and-white copies will be distributed to the PAC review committee, the use of color figures is discouraged.

1. Background and objectives of the proposal

Background and objectives of the proposal should be presented in a self-explanatory manner. You should be aware that some members of the PAC review committee may not be familiar to specific details of the research field. The necessity for using heavy-ion beams for these experiments, as well as additional merits for using heavy-ion beams in related disciplines, should be emphasized.

2. Experimental Methods

The details of the experiment, including the setup of equipments, handling of targets, beam-irradiation schedule, data acquisition, etc., should be explained. If special devices are to be used, details of including logistics relating to installation and operation of the device should be clarified. A description of ion species, the irradiation field-size, energies, intensities, and quality of beams should be included. Beam time schedules or critical timing restrictions should be mentioned.

Plans for future studies should be outlined if the experiments are expected to continue in a 2nd or 3rd year.

3. Progress up to this point (if this is a renewal application)

Progress of the experiments at HIMAC up to this point should be summarized.

Additional procedures are requested if the proposal is in the 4th consecutive year (19J\*\*\*, 19H\*\*\* ). In this case, a more detailed summary of the last 3 years should be attached. This is a separate document with a length of around 3 pages. Contents overlapping with previous annual reports are acceptable.

4. Estimation of the beam time

The request for necessary beam time should be based on the experiment plan. This should include a description that emphasizes the feasibility of the entire experimental process.

5. Target material

Biology Experiments

It is essential to characterize targets used for the experiments including *in vitro, in vivo* or other systems. The size, structure, and composition of any target containers should be described. Information relating to beam characteristics (e.g., size and uniformity) as well as absorbed dose and dose rates should be included.

For *in vitro* systems: any processing before and after irradiation, such as incubation, should be explained. This includes duration and necessary equipment.

For *in vivo* systems: the kind of animals, number of animals, and a method for transporting those animals, should be explained as well as handling and feeding procedures before and after irradiation.

Special attention should be devoted to the proposal when recombinant DNA, cells or animals are to be used. It is strongly recommended to contact the liaison person at QST-Chiba before submission in those cases.

Physics Experiments

A list describing the desired targets should include the material, size, as well as desired ion, beam shape and intensity.

6. List of the publications

Papers published by participants should be listed using to the following instructions. This list should be succinctly related to the scientific objectives of this proposal. Failure to follow these instructions, or the inclusion of extensive or unnecessary information, may result in low scores.

1. The list of publications should be closely related to the proposal, and published during the last 5 years.
2. The list should be sorted chronologically from recent to old. Do not sort them according to authors.
3. A title, names of authors, name of journal, volume number, pages, year of publication should be included.
4. Authors who are also participants of this proposal should be underlined in the list.

\* Safety evaluations, special requirements, and other safety matters should be documented in the “Safety Issues and Special Requirements” checklist.