

# TASK GROUP 118

## Relative Biological Effectiveness (RBE), Quality Factor (Q), and Radiation Weighting Factor (wR)

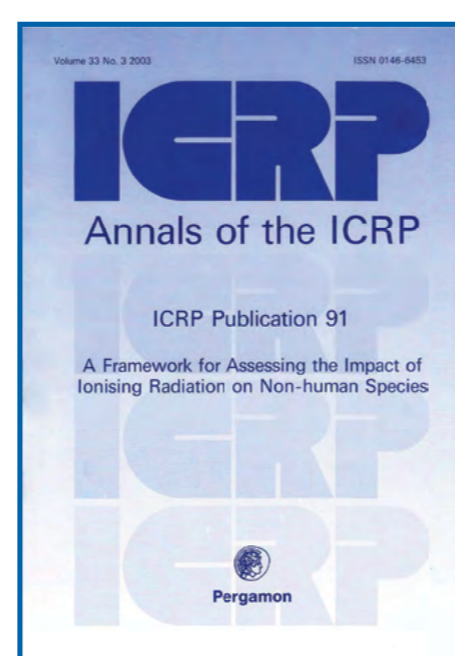
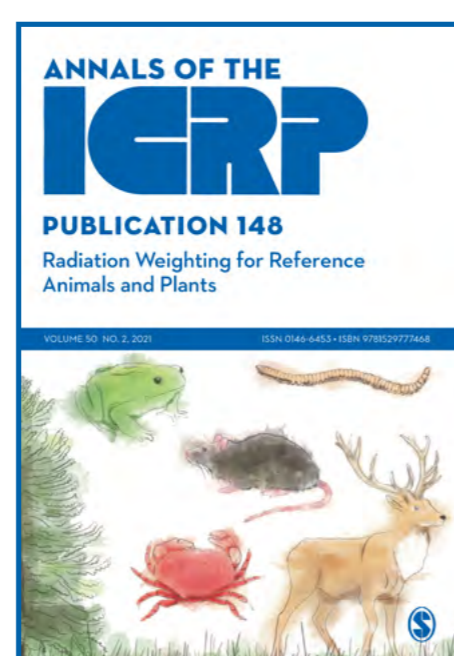
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### Introduction

Joint Task Group between C1, C2 and C3

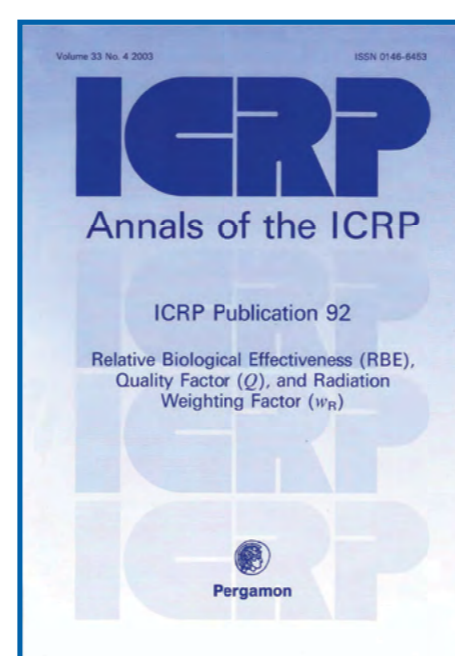
#### Objectives:

- To review scientific literature related to RBE, Q and WR since ICRP 92 done in 2002
- To provide advice about whether the new information would impact ICRP recommendations on radiological protection.
- The report will include both tissue-specific and stochastic endpoints.
- Epidemiology is being considered in this report.
- Relevant ICRP publications: New ICRP Publication 148 on RBE for alpha- and beta-emitted radionuclides, ICRP Publication 91 on DDREF



### Progress

- Ongoing: Collection of literature that informs RBE, wR, and Q discussion
- Review of the ToC for the ICRP Publication 92 report indicated that an update (rather than a full new report) would be appropriate.
- Important to explore new areas not covered in ICRP Publication 92 that would be added to the report: non-human biota, more information on tissue reactions is now available, alternatives to RBE, possibly additional information on p+ RBE
- Group has begun creating the draft of the document



### Workshops Held

All workshops were done to fill in the gaps in knowledge as suggested by TG118 members:

#### 18 December 2021

Update on RBE for Japanese Atomic Bomb Survivors  
(Harry Cullings, Linda Walsh, Luana Hafner)

#### 16 March 2022

Exploring RBE Part 1  
(Laure Sabatier, Andrzej Wojcik)

#### 17 May 2022

Exploring RBE Part 2  
(Igor Shuryak, David Brenner, Tatsu Sato)

#### 8 February 2023

Radiation Quality Factor Parameter in Radiation Protection  
(Hans-Georg Menzel)

#### 7 June 2023

Neutron RBEs  
(Michiaki Kai)

### Upcoming

- Another zoom conference is expected in fall.
- A short face-to-face will take place at the Kyoto meeting.

### Current Table of Contents

- Abstract; Preface; Main Points; Glossary; Executive Summary
- Introduction (Background, Scope and Objectives, Structure of this Report)
- Concept of RBE (Background, Reference Radiation, Uses of RBE)
- Determination of RBE Values/Quantification (RBE and Its Determinations, Different Radiations, Modeling Approaches)
- Alternatives to RBE; Clinical
- External Exposure vs Internal Emitters; Concept of Dose
- Weighting Factors for Radiation Quality (Concepts of wR and Q, Uses of wR and Q, Neutron Issues)
- Deterministic Effects (Considerations Different than Stochastic Effects, Opacifications, RBE for Late Tissue Injury, Other Non-cancer Effects)
- Epidemiology
- Environment
- Cellular and Molecular Endpoints
- Conclusions and Summary
- References

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