50 years of *Radiation and Environmental Biophysics*: What were the hallmark papers?

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You certainly have noticed that this year *Radiation and Environmental Biophysics* celebrates its 50-year anniversary (Rühm and Friedl 2013). This is a good opportunity to look back and identify those manuscripts in the journal that later turned out to be of scientific importance for the further developments in radiation research. Of course, the definition of *hallmark papers* is not as straightforward as it may appear at first glance, and different criteria may be used in that process. Each approach has its pros and cons. For example, citation rates can provide a hint on the acceptance a certain article has received in the scientific community. They depend, however, on the scientific field, and when we had a look in our citation records, we realized that most of the top-ranking papers were from a time when the emphasis of the journal was much more on biophysics than on radiation sciences. The number of full-text downloads from the REB website may be another indicator of importance, but may not adequately represent manuscripts that were published in the early phase of our journal. Furthermore, we did not want to shift all responsibility on to pure metrics.

In the end, after considering all possible options, we decided to ask our Associate Editors and our Editorial Board members to identify those papers which THEY consider hallmark. Of course, more recent papers will

come to mind more easily than older ones, and most scientists will not be very aware of papers that were published before their own active period. Because we believe, however, that our Associate Editors and Board members represent a fair cross-section over the scientific areas relevant for REB and because they show quite a representative mixture between younger and older scientists, we trust that their choice is a good representation of the journal's highlights of the last 50 years. As indicated in Table 1, indeed the list of nominated papers covers almost the whole 50-year period, starting with Wachsmann and Jaschke (1963), at a time when the journal was still called *Biophysik*, and ending with Farkas et al. (2011). While a certain bias towards more recent papers is evident, there are quite some nominations from the last century (Fig. 1). Indeed, the paper most often nominated (5 times) was Kellerer and Chmelevsky (1975): *Concepts of Microdosimetry. III. Mean values of the microdosimetric distribution*. The list in Table 1 also reflects the traditional emphases of this journal: radio-ecology and dosimetry, risk estimation from epidemiological studies, radiobiology, and mechanistic modelling. And it reflects a long-lasting policy of openness towards scientists from countries where publishing in international journals is not always easy.

A selection from the nominated papers is currently being made (again) available in a virtual anniversary issue of *Radiation and Environmental Biophysics*—thanks to our publisher house Springer who in this way wants to demonstrate appreciation of the successful 50-year story of REB. Feel free to visit our website, enjoy these historic papers, and even develop your own personal hallmark list.

As Editors-in-Chief, we want to thank our Associate Editors and Members of the Editorial Board for their formidable work. We also want to thank our authors and readers without whom this journal would not live.

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Table 1 List of nominated papers

- Farkas A, Hofmann W, Balásházy I, Szoke I, Madas BG, Moustafa M (2011) Effect of site-specific bronchial radon progeny deposition on the spatial and temporal distributions of cellular responses. *Radiat Environ Biophys* 50:281–297
- Walsh L, Kaiser JC (2011) Multi-model inference of adult and childhood leukaemia excess relative risks based on the Japanese A-bomb survivors mortality data (1950–2000). *Radiat Environ Biophys* 50:21–35
- Fesenko S, Fesenko E, Titov I, Karpenko E, Sanzharova N, Fonseca AG, Brown J (2010) Radionuclide transfer to marine biota species: review of Russian language studies. *Radiat Environ Biophys* 49:531–547
- Wakeford R, Darby SC, Murphy MF (2010) Temporal trends in childhood leukaemia incidence following exposure to radioactive fallout from atmospheric nuclear weapons testing. *Radiat Environ Biophys* 49:213–227. Erratum in: *Radiat Environ Biophys* 49:503
- Birchall A, Puncher M, Harrison J, Riddell A, Bailey MR, Khokhryakov V, Romanov S. Plutonium worker dosimetry (2010) *Radiat Environ Biophys* 49:203–212
- Shuryak I, Hahnfeldt P, Hlatky L, Sachs RK, Brenner DJ (2009) A new view of radiation-induced cancer: integrating short- and long-term processes. Part II: second cancer risk estimation. *Radiat Environ Biophys* 48:275–286 Erratum in: *Radiat Environ Biophys* 50:607–608
- Kaiser JC, Jacob P, Blettner M, Vavilov S (2009). Screening effects in risk studies of thyroid cancer after the Chernobyl accident. *Radiat Environ Biophys* 48:169–179
- Greubel C, Hable V, Drexler GA, Hauptner A, Dietzel S, Strickfaden H, Baur I, Krücken R, Cremer T, Dollinger G, Friedl AA (2008). Competition effect in DNA damage response. *Radiat Environ Biophys* 47:423–429
- Ivanov VK, Chekin SY, Kashcheev VV, Maksioutov MA, Tumanov KA (2008) Risk of thyroid cancer among Chernobyl emergency workers of Russia. *Radiat Environ Biophys* 47:463–467
- Feinendegen L, Hahnfeldt P, Schadt EE, Stumpf M, Voit EO (2008) Systems biology and its potential role in radiobiology. *Radiat Environ Biophys* 47:5–23
- Vives i Batlle J, Balonov M, Beaugelin-Seiller K, Beresford NA, Brown J, Cheng JJ, Copplestone D, Doi M, Filistovic V, Golikov V, Horyna J, Hosseini A, Howard BJ, Jones SR, Kamboj S, Kryshev A, Nedveckaite T, Olyslaegers G, Pröhl G, Sazykina T, Ulanovsky A, Vives Lynch S, Yankovich T, Yu C (2007) Inter-comparison of absorbed dose rates for non-human biota. *Radiat Environ Biophys* 46(4):349–373
- Jacob P, Meckbach R, Sokolnikov M, Khokhryakov VV, Vasilenko E (2007) Lung cancer risk of Mayak workers: modelling of carcinogenesis and bystander effect. *Radiat Environ Biophys* 46:383–394
- Prysyazhnyuk A, Gristchenko V, Fedorenko Z, Gulak L, Fuzik M, Slipenyuk K, Tirmarche M (2007) Twenty years after the Chernobyl accident: solid cancer incidence in various groups of the Ukrainian population. *Radiat Environ Biophys* 46:43–51
- Ivanov VK, Gorski AI, Tsyb AF, Maksioutov MA, Tumanov KA, Vlasov OK (2006) Radiation-epidemiological studies of thyroid cancer incidence among children and adolescents in the Bryansk oblast of Russia after the Chernobyl accident (1991–2001 follow-up period). *Radiat Environ Biophys* 45:9–16
- Huber T, Rühm W, Kato K, Egbert SD, Kubo F, Lazarev V, Nolte E (2005) The Hiroshima thermal-neutron discrepancy for ^{36}Cl at large distances. Part I: New (^{36}Cl) measurements in granite samples exposed to A-bomb neutrons. *Radiat Environ Biophys* 44:75–86
- Nolte E, Huber T, Rühm W, Kato K, Lazarev V, Schultz L (2005). The Hiroshima thermal-neutron discrepancy for ^{36}Cl at large distances. Part II: Natural in situ production as a source. *Radiat Environ Biophys* 44:87–96
- Mokrov YG (2004) Dose assessment for the Metlino and Muslyumovo populations who lived along the Techa river from 1949 to 1954. *Radiat Environ Biophys* 43:209–218
- Walsh L, Rühm W, Kellerer AM (2004) Cancer risk estimates for gamma-rays with regard to organ-specific doses. Part I: All solid cancers combined. *Radiat Environ Biophys* 43:145–151
- Mokrov YG (2004) External radiation exposure of residents living close to the Mayak facility: main sources, dose estimates, and comparison with earlier assessments. *Radiat Environ Biophys* 43:127–139 Erratum in: *Radiat Environ Biophys* 43:311
- Ivanov VK, Gorski AI, Tsyb AF, Ivanov SI, Naumenko RN, Ivanova LV (2004) Solid cancer incidence among the Chernobyl emergency workers residing in Russia: estimation of radiation risks. *Radiat Environ Biophys* 43:35–42
- Hauptner A, Dietzel S, Drexler GA, Reichart P, Krücken R, Cremer T, Friedl AA, Dollinger G (2004) Microirradiation of cells with energetic heavy ions. *Radiat Environ Biophys* 42:237–245
- Mokrov YG (2003) Reconstruction of the radionuclide spectrum of liquid radioactive waste released into the Techa river in 1949–1951. *Radiat Environ Biophys* 42:7–15
- Mokrov YG (2002) A reconsideration of the external dose assessment for the Techa river population. *Radiat Environ Biophys* 41:303–306
- Gapanovich VN, Iaroshevich RF, Shuvaeva LP, Becker SI, Nekolla EA, Kellerer AM (2001) Childhood leukemia in Belarus before and after the Chernobyl accident: continued follow-up. *Radiat Environ Biophys* 40:259–267
- Zankl M, Wittmann A (2001) The adult male voxel model “Golem” segmented from whole-body CT patient data. *Radiat Environ Biophys* 40:153–162
- Müller WU, Bauch T, Stüben G, Sack H, Streffer C (2001) Radiation sensitivity of lymphocytes from healthy individuals and cancer patients as measured by the comet assay. *Radiat Environ Biophys* 40:83–89
- Heidenreich WF, Brugmans MJ, Little MP, Leenhouts HP, Paretzke HG, Morin M, Lafuma J (2000) Analysis of lung tumour risk in radon-exposed rats: an intercomparison of multi-step modelling. *Radiat Environ Biophys* 39:253–264

Table 1 continued

- Little MP, Muirhead CR, Haylock RG, Thomas JM (1999) Relative risks of radiation-associated cancer: comparison of second cancer in therapeutically irradiated populations with the Japanese atomic bomb survivors. *Radiat Environ Biophys* 38:267–283
- Nikjoo H, O'Neill P, Terrissol M, Goodhead DT (1999) Quantitative modelling of DNA damage using Monte Carlo track structure method. *Radiat Environ Biophys* 38:31–38
- Khokhryakov VF, Kellerer AM, Kreisheimer M, Romanov SA (1998) Lung cancer in nuclear workers of Mayak. A comparison of numerical procedures. *Radiat Environ Biophys* 37:11–17
- Ottolenghi A, Merzagora M, Paretzke HG (1997) DNA complex lesions induced by protons and alpha-particles: track structure characteristics determining linear energy transfer and particle type dependence. *Radiat Environ Biophys* 36:97–103
- Kellerer AM, Nekolla E (1997) Neutron versus gamma-ray risk estimates. Inferences from the cancer incidence and mortality data in Hiroshima. *Radiat Environ Biophys* 36:73–83
- Heidenreich WF (1996) On the parameters of the clonal expansion model. *Radiat Environ Biophys* 35:127–129
- Frankenberg-Schwager M, Frankenberg D, Harbich R, Beckonert S (1994) Evidence against the “oxygen-in-the-track” hypothesis as an explanation for the radiobiological low oxygen enhancement ratio at high linear energy transfer radiation. *Radiat Environ Biophys* 33:1–8
- Likhtarev IA, Gulko GM, Sobolev BG, Kairo IA, Chepurinov NI, Pröhl G, Henrichs K (1994) Thyroid dose assessment for the Chernigov region (Ukraine): estimation based on ¹³¹I thyroid measurements and extrapolation of the results to districts without monitoring. *Radiat Environ Biophys* 33:149–166
- Lett JT (1992) Damage to cellular DNA from particulate radiations, the efficacy of its processing and the radiosensitivity of mammalian cells. Emphasis on DNA double strand breaks and chromatin breaks. *Radiat Environ Biophys* 31:257–277
- Makrigiorgos G, Adelstein SJ, Kassis AI (1990) Auger electron emitters: insights gained from in vitro experiments. *Radiat Environ Biophys* 29:75–91
- Booz J, Paretzke HG, Pomplun E, Olko P (1987) Auger-electron cascades, charge potential and microdosimetry of iodine-125. *Radiat Environ Biophys* 26:151–162
- Trott KR (1982) Experimental results and clinical implications of the four R's in fractionated radiotherapy. *Radiat Environ Biophys* 20:159–170
- Hofmann W (1982) Cellular lung dosimetry for inhaled radon decay products as a base for radiation-induced lung cancer risk assessment. I. Calculation of mean cellular doses. *Radiat Environ Biophys* 20:95–112
- Hofmann W (1982) Cellular lung dosimetry for inhaled radon decay products as a base for radiation-induced lung cancer risk assessment. II. Microdosimetric calculations. *Radiat Environ Biophys* 20:113–122
- Michalowski A (1981) Effects of radiation on normal tissues: hypothetical mechanisms and limitations of in situ assays of clonogenicity. *Radiat Environ Biophys* 19:157–172
- Kaul A, Roedler HD (1980) Radioiodine: biokinetics, mean dose and dose distribution. *Radiat Environ Biophys* 18:185–195
- Rossi HH (1979) The role of microdosimetry in radiobiology. *Radiat Environ Biophys* 17:29–40
- Bond VP (1979) Quantitative risk in radiation protection standards. *Radiat Environ Biophys* 17:1–28
- Kaul A, Muth H (1978) Thorotrast kinetics and radiation dose: results from studies in thorotrast patients and from animal experiments. *Radiat Environ Biophys* 15:241–259
- Rossi HH (1977) A proposal for revision of the quality factor. *Radiat Environ Biophys* 14:275–283
- Jacobi W (1975) The concept of the effective dose—a proposal for the combination of organ doses. *Radiat Environ Biophys* 12:101–109
- Kellerer AM, Chmelevsky D (1975) Concepts of microdosimetry. III. Mean values of the microdosimetric distributions. *Radiat Environ Biophys* 12:321–335
- Kellerer AM, Chmelevsky D (1975) Concepts of microdosimetry II. Probability distributions of the microdosimetric variables. *Radiat Environ Biophys* 12:205–216
- Kellerer AM, Chmelevsky D (1975) Concepts of microdosimetry. I. Quantities. *Radiat Environ Biophys* 12:61–69
- Jacobi W (1973) [The lung cancer risk by inhalation of Rn-222-decay products (author's transl)]. *Biophysik* 10:103–114. German
- Jacobi W (1965) [Effect of natural radiation on the respiratory tract]. *Biophysik* 2:282–300. German
- Oberhausen E (1963) Die Altersabhängigkeit des Kalium- und Cäsium-137-Gehaltes des Menschen. *Biophysik* 1:135–142
- Wachsmann F., Jaschke E (1963) Tiefendosis und seitlicher Dosisabfall bei Strahlungen verschiedener Homogenität. *Biophysik* 1: 108–113

Fig. 1 Number of papers nominated as *hallmark papers* per publication year

References

- Farkas A, Hofmann W, Balásházy I, Szoke I, Madas BG, Moustafa M (2011) Effect of site-specific bronchial radon progeny deposition on the spatial and temporal distributions of cellular responses. *Radiat Environ Biophys* 50:281–297
- Kellerer AM, Chmelevsky D (1975) Concepts of microdosimetry. III. Mean values of the microdosimetric distributions. *Radiat Environ Biophys* 12:321–325
- Rühm W, Friedl AA (2013) Fifty years ago. *Radiat Environ Biophys* 52:1–3
- Wachsmann F, Jaschke E (1963) Tiefendosis und seitlicher Dosisabfall bei Strahlungen verschiedener Homogenität. *Biophysik* 1:108–113