Radiotherapy and Oncology 128 (2018) 76–82

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

ENLIGHT

ENLIGHT: European network for Light ion hadron therapy

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ARTICLE INFO

Article history:
Received 8 February 2018
Accepted 11 March 2018
Available online 3 April 2018

Keywords:
Enlight
Ulice
Partner
Envision
Cern
Estro

ABSTRACT

The European Network for Light Ion Hadron Therapy (ENLIGHT) was established in 2002 following various European particle therapy network initiatives during the 1980s and 1990s (e.g. EORTC task group, EULIMA/PIMMS accelerator design). ENLIGHT started its work on major topics related to hadron therapy (HT), such as patient selection, clinical trials, technology, radiobiology, imaging and health economics. It was initiated through CERN and ESTRO and dealt with various disciplines such as (medical) physics and engineering, radiation biology and radiation oncology. ENLIGHT was funded until 2005 through the EC FP5 programme. A regular annual meeting structure was started in 2002 and continues until today bringing together the various disciplines and projects and institutions in the field of HT at different European places for regular exchange of information on best practices and research and development. Starting in 2006 ENLIGHT coordination was continued through CERN in collaboration with ESTRO and other partners involved in HT. Major projects within the EC FP7 programme (2008–2014) were launched for R&D and transnational access (ULICE, ENVISION) and education and training networks (Marie Curie ITNs: PARTNER, ENTERVISION). These projects were instrumental for the strengthening of the field of hadron therapy.

With the start of 4 European carbon ion and proton centres and the upcoming numerous European proton therapy centres, the future scope of ENLIGHT will focus on strengthening current and developing European particle therapy research, multidisciplinary education and training and general R&D in technology and biology with annual meetings and a continuously strong CERN support. Collaboration with the European Particle Therapy Network (EPTN) and other similar networks will be pursued.

Networking in non-conventional radiotherapy techniques (named as "Hadrons" or "Heavy Particles") was already an important activity in Europe in the 80s and 90s, dealing mainly with neutron radiotherapy and, to some minor degree, with proton radiotherapy, The different teams involved in these treatments – in particular (medical) physicists, radiobiologists, clinicians – met annually at various places in Europe (preferably treatment centres) under the umbrella of the EORTC Heavy Particle Therapy Group, which became later the European Heavy Particle (Hadron) Therapy Group. These meetings dealt with the major aspects of hadron therapy in regard to technology, (medical) physics, radiobiology and clinical medicine. The programme usually also contained reports on progress in centre development and mono-centre and multi-centre clinical results. Whenever possible major contributions of these meetings were published as Proceedings in radiation oncology journals [1,2].

New initiatives were evolving in Europe in the 90s in Darmstadt/Heidelberg, Vienna, Milan, Lyon, Stockholm to develop advanced heavy particle radiotherapy and in particular carbon ion radiotherapy. These initiatives were linked to national and international activities in accelerator physics (e.g. GSI, TERA, CERN, AUSTRON, ETOILE, Karolinska Institute) to promote and develop the synchrotron technology best suited for therapy, following the EULIMA project which had failed 25 years ago (Project for a European Medical Accelerator). Such technology had to become competitive with the rapidly evolving field of high precision photon radiotherapy [2]. These new initiatives mainly dealt with the replacement of fast neutron radiotherapy, which had failed due to poor technology that had resulted in significant morbidity. These European initiatives for carbon ion radiotherapy were in parallel with the early clinical phase of the first carbon ion radiotherapy facility at Chiba (NIRS) in Japan, where the first patient was treated in 1994, based on two very large synchrotrons. This followed the neutron radiotherapy experience in Japan [3].

In 1996 the design of a synchrotron optimized for hadron therapy was initiated under the name of PIMMS (Proton Ion Medical

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https://doi.org/10.1016/j.radonc.2018.03.014
0167-8140/© 2018 CERN. Published by Elsevier B.V.

Machine Studies) by a CERN-TERA-MedAustron collaboration, which led to the construction of two centres [4], CNAO in Pavia, Italy (first patient treated in 2011) and MedAustron in Wiener Neustadt, Austria (first patient treated in 2016). The PIMMS design also included advanced proton radiotherapy.

Proton radiotherapy technology development consisted those days mainly of activities for commercialization of this modality, such as IBA, which evolved from the neutron radiotherapy engineer group at the Cyclotron of the Catholic University in Louvain La Neuve. Major research and development activities took place in single proton therapy institutions such as PSI in Villigen, Switzerland, Clatterbridge, UK, Uppsala, Sweden (where the very first patient was treated in Europe in 1957). PTCOG was the international network for centres practicing and developing proton radiotherapy started in Harvard, Boston with their 1st meeting in 1985.

Therefore, at the end of the 90s there was an increasing need for communication, in particular among the new initiatives for carbon ion therapy development related to technology, accelerator physics, medical physics, radiobiology and clinical medicine. This resulted in a need for a new framework of international communication and collaboration.

Radiotherapy with hadron therapy – which are the benefits

Hadron Therapy (HT) – or Particle Therapy – is a precise form of radiotherapy that uses charged particles instead of X-rays to deliver a dose of radiotherapy for patients. Radiation therapy with hadrons (protons and other light ions) can overcome the limitations of X-rays since nuclear particles deposit most of their energy at the end of their range and these beams can be shaped with great precision.

Protons are low-LET (Linear Energy Transfer) particles, since they exhibit a LET of less than 20 keV/μm over their entire range. This LET is similar to the conventional beam qualities applied in radiation oncology, i.e. high-energy photon and electron beams. Consequently, protons exhibit, at the end of their range in the body, only a slightly increased radiobiological effectiveness (RBE) as compared to conventional beam qualities. Due to the characteristic depth dose profile with a Bragg-Peak, that spares healthy tissue distal to the tumour, protons give a smaller dose to healthy tissue surrounding the tumour. Thus, the fundamental rationale for their use is the improved physical selectivity, i.e. better dose conformation properties which enable better sparing of organs at risk and hence the potential of reducing side effects [5].

Tumour types that respond well to radiotherapy with low-LET ions are those that benefit from the improved physical selectivity as compared to conventional therapy [6]. Many paediatric tumours are eligible for protons, as the therapy related morbidity could be improved compared to conventional therapy [7].

Carbon ions share the same favourable physical properties of protons but in addition have a biological advantage. Their RBE increases in the last centimetres of the beam's range, whereas it is low in the entrance channel. When different clinical situations are considered, the biological advantages of carbon ions in comparison to protons are expected to be most pronounced for tumours that demonstrate low radio-sensitivity when treated with photons. Local RBE values can be as high as 4 for carbon ion radiotherapy and depend on many factors, which have to be addressed during treatment planning. Japanese data corroborate the assumption that the therapeutic ratio increases, if short-course hypo-fractionation schemes are used in carbon ion radiotherapy [8]. As documented in the literature, many radio-resistant slow-growing tumours respond well to carbon ion therapy [3].

Current status and growing number of proton and carbon ion centres

Over the last two decades, hadron therapy has gained huge momentum. Many new centres have been built, and many more are under construction, and in planning stage (Fig. 1). At the end of 2017 there were 72 centres in operation worldwide and another 68 are in construction or in the planning stage. Most of these are proton centres: 27 in US (protons only); 19 in Europe (three dual centres); 17 in Japan (four carbon and one dual); three (one carbon and one dual) in China; and four in other parts of the world. By 2021 there will be 140 centres operating in nearly 30 countries. European centres are shown in Fig. 2; while Fig. 3 shows that the cumulated number of treated patients is growing almost exponentially [9,10].

At the end of 2007, 61,855 patients had been treated (53,818 with protons and 4,450 with carbon ions). At the end of 2017 the number had grown to 170,925 (149,345 with protons and 21,580 with carbon ions) [9]. This is due primarily to the greater availability of dedicated centres able to meet the growing demand for this particular form of radiotherapy, and most probably in future it will have a larger growth rate, with the increase of the patient throughput per centre.

European Network for Light ion Therapy (ENLIGHT)

The European Network for Light Ion Therapy was founded on the basis of various developments in the field of particle therapy during the 1980s and 1990s. Specific projects in different European countries had been conceived, but there was the common vision that these initiatives had to come together, so as to globally strengthen the efforts in order to successfully establish light ion radiotherapy.

The purpose of a Hadron Therapy collaboration was defined in an ESTRO meeting chaired by Richard Pötter in December 2000 in Vienna where the completed PIMMS study was presented and an ESTRO Hadron Therapy group was initiated. This was followed by a second meeting called by Jean-Pierre Gérard, at the time ESTRO President – to submit a proposal to the European Framework Programme FP5.

Ugo Amaldi, Jean-Pierre Gérard, Gerard Kraft and Hans Svensson were given the responsibility for putting together the proposal of a new Network; the work was coordinated by Germaine Heeren. This group, supported by others such as André Wambersie, Richard

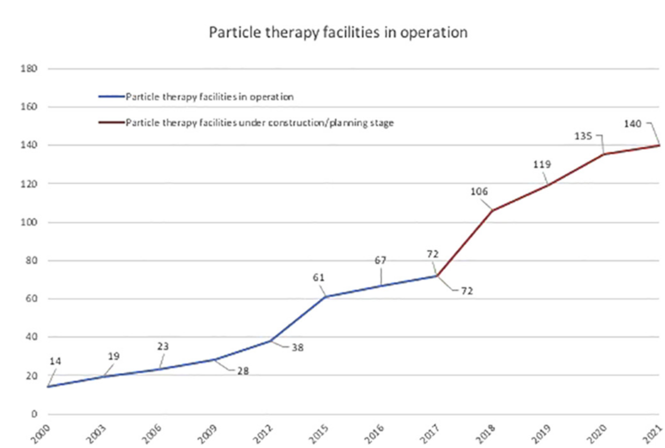

Fig. 1. Hadron therapy facilities in operation worldwide, under construction and/or in the planning stage at the end of 2017 (http://www.ptcog.ch/index.php/).

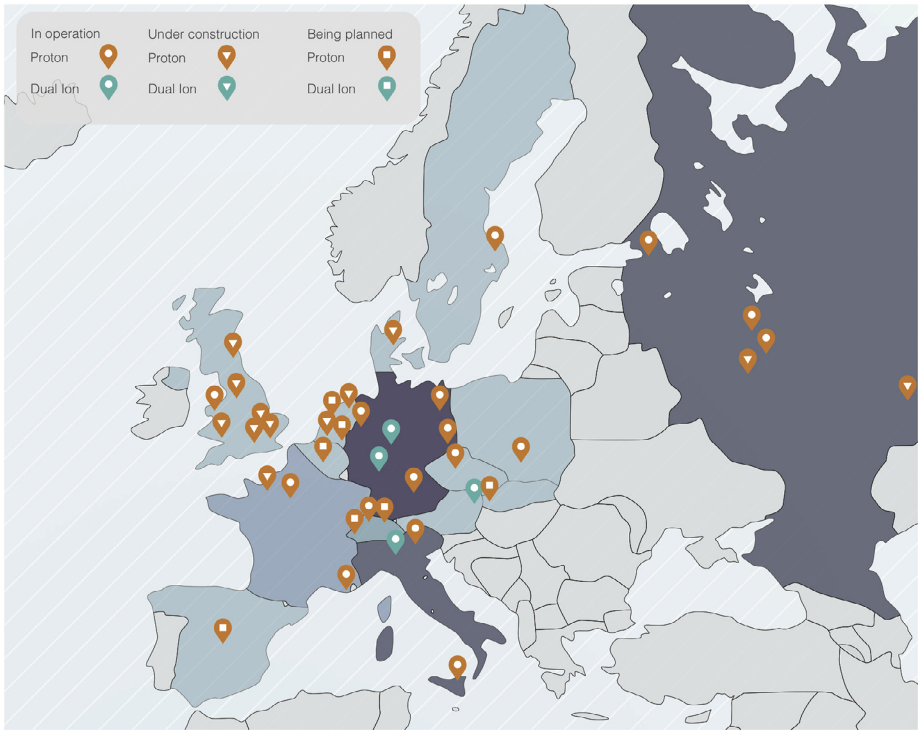

Fig. 2. European facilities in operation, under construction and/or approved (http://www.ptcog.ch/index.php/).

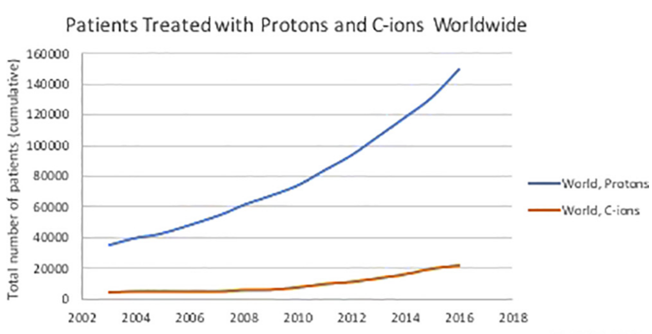

Fig. 3. Patients treated with protons and carbon worldwide by the end 2017 (http://www.ptcog.ch/index.php/).

Pötter, Jürgen Debus, Wolfgang Enghardt and Anders Brahme prepared and organized a comprehensive programme that included a range of topics, such as patient selection modalities, preparation of clinical trials, technology, radiobiology, imaging, and health economics.

For the 10-year anniversary of ENLIGHT, JP Gerard wrote "*during my presidency of ESTRO, between 1999 and 2001, the European Framework Programme offered a good opportunity to initiate a European cooperative action bringing together all the teams interested in the field. It was thanks to the energy and vision of Germaine Heeren, the general secretary of ESTRO, that it was possible to create the ENLIGHT group: the* ***European Network for Light Ion Hadron Therapy*** *[11]. In collaboration with CERN, a memorandum of understanding was signed in 2001, and this was the basis of a call for grant from the EU 5th Framework Programme. This grant was modest but represented a strong incentive to create, with the intrinsic support of CERN, a dynamic collaboration between all the radiation oncologists and physicists involved in this great hadron adventure. It is a real pleasure to see 10 years later that the dreams of these pioneers are becoming reality in Heidelberg, Pavia and in other European centres, for the benefit of patients*" [12].

The ENLIGHT had its inaugural meeting at CERN in February 2002. It was established to coordinate the various European projects and to promote international discussions to evaluate the advantages of using hadrons for radiation therapy. Funded by the European Commission for three years, the network was formed from a collaboration of clinical and university centres, institutions and scientists involved in research and in the advancement and realization of hadron therapy facilities in Europe.

About 70 specialists from different disciplines, including radiation biology, oncology, physics and engineering, attended this first gathering: this was a considerable achievement, at a time when "multidisciplinarity" was not yet a buzz word [13]. Some of the results are summarized in an extra issue of Radiotherapy and Oncology, which compiled the proceedings of two ENLIGHT meetings in Baden, Austria in 2002 and in Lyon, France in 2003 [14]. In June 2005 TERA organized the last meeting in Oropa (Biella, Italy), where it was decided to launch a continuation of the collaboration under the name ENLIGHT++, the first + indicating that the initiative would include also protons, and the second + pointing to a widening of the collaboration to other groups.

Thus, at the end of the ENLIGHT EC funding in 2006, a brainstorming session among the community from around 20 European countries took place at CERN. The participants felt that ENLIGHT was a key ingredient for future progress and therefore should be maintained and broadened. It was agreed by the community that the goals of the network could be best met by two complementary aspects: research and networking. The **research** in areas needed for effective hadron therapy, and the **networking** essential for establishing and implementing common standards and protocols for treating patients. Indeed the primary mandate of the ENLIGHT coordinator (Manjit Dosanjh from 2006 onwards) was to develop strategies for securing funding necessary for the continuation of the initiative in these two fundamental aspects [15,16]

Role and function of ENLIGHT

Since the Initial ENLIGHT meeting at CERN in February 2002, **ENLIGHT meetings** have been held annually all over Europe: Austria, Denmark, France, Italy, Netherlands, Poland, Spain and Sweden, Switzerland, UK http://enlight.web.cern.ch/enlight-meetings. A major achievement of these meetings is the blending of traditionally separate communities so that clinicians, physicists, biologists and engineers – with experience and interest in hadron therapy – are able to disseminate and share research results and information within the multidisciplinary scientific community; participation open and free and actively promotes participation of young researchers by dedicated oral poster sessions. The periodical "ENLIGHT Highlights" which was launched in 2012 to celebrate 10 years of ENLIGHT continues to flourish: http://enlight.web.cern.ch/media/highlights.

EC funding and coordination of projects developing, establishing and optimizing hadron therapy

While the ENLIGHT network itself flourishes without direct dedicated funding since 2006, the R&D and training activities under the umbrella of ENLIGHT have been funded primarily through European Commission (EC) projects. Between 2008 and 2015, four projects were submitted under the umbrella of ENLIGHT [17], ULICE (Union of Light Ion Centres in Europe) coordinated by Roberto Orecchia-CNAO, ENVISION (European Novel Imaging Systems for Ion Therapy) and ENTERVISION (Research Training in 3D Imaging for Cancer Radiation Therapy) and PARTNER (Particle Training Network for European Radiotherapy) coordinated by Manjit Dosanjh-CERN. The four research and training projects together were funded with 24.6 million Euros by the EC. http://enlight.web.cern.ch/projects.

PARTNER: Particle training network for European radiotherapy http://enlight.web.cern.ch/projects/partner

Training of specialized young professionals for the upcoming European Ion Beam Facilities was seen as a clear necessity for ENLIGHT in the Seventh Framework Programme (FP7) call. Therefore, the Particle Training Network for European Radiotherapy (PARTNER) was funded by the EC, coordinated by Manjit Dosanjh (CERN) and started in 2008, a 4-year Marie Curie Initial Training Network involving 10 institutes and research centres and two industrial partners. PARTNER was an interdisciplinary, multinational initiative that had the primary goal of training researchers who will help to improve the overall efficiency of ion beam therapy in cancer treatment. All collaborators were known worldwide in the diverse, but complementary, fields associated with hadron therapy: clinical, radiobiological and technological. Thus, the network covered a unique set of competencies, expertise, infrastructures and outstanding training possibilities for young researchers. CERN was the coordinator of the 4-year PARTNER project, which was funded to train 29 researchers in member states throughout Europe from a variety of backgrounds and countries, between 2008 and 2012.

The PARTNER network made important contributions to key research areas connected to hadron therapy, geared towards the optimization of this option for cancer treatment.

More than 90% of the PARTNER researchers found positions shortly after the end of the project; thanks to the expertise acquired at the most advanced European hadron therapy centres and due to the networking opportunities.

The medical doctors from India and Singapore went back to their countries and hospitals, while most of the other researchers are now working in hadron-therapy facilities in Europe, the US and Japan. The specific goal of training experts for upcoming and operational facilities was therefore successfully met, and the researchers ensure that the network lives on, wherever they are in the world. The open access publication of papers from PARTNER in the dedicated issue of *Journal of Radiation Research* provided the opportunity to openly share the results [18].

ULICE: Union of Light ion centres in Europe http://enlight.web.cern.ch/projects/ulice

The Union of Light Ion Centres in Europe (ULICE) was a European Commission funded infrastructure project, under the umbrella ENLIGHT and coordinated by Roberto Orecchia from the National Italian Centre for Oncologic Hadron Therapy (CNAO). The project was launched in 2009 in response to a need for greater access to hadron therapy facilities for clinical and technological research and to encourage collaboration among existing and planned centres within the ion therapy community. It brought together 175 members from 20 European institutions including all existing and planned therapy centres; two research centres (CERN and GSI); and 2 leading industrial partners. The project addressed two different complementary issues:

1. The development of appropriate instruments for more affordable and effective hadron therapy, with particular emphasis on carbon ion therapy.
2. The need for intensive collaboration among existing and future centres, as well as the European hadron therapy community at large.

The project was based on three pillars: Joint research activities; development of instruments and protocols; increasing cooperation between facilities and research communities within the research infrastructure transnational access to treatment centres and networking.

Joint research activities (JRA)

This pillar was led by Richard Poetter from the Medical University of Vienna, focussed on improving the performance of hadron therapy facilities through the development of instruments. Key clinical issues being dealt with include [19–21]

- Developing Concepts and Terms for Dose Volume reporting for Carbon Ion Radiotherapy.
- Develop SOPs for clinical trials for hadron therapy and research Infrastructures for multi-centre clinical and translational research.
- Identifying tumours whose treatment would benefit most if protons or other ions were used instead of X-ray beams.
- Developing a computer assisted patient selection program accessible to the entire European community, to enable an efficient patient referral system in addition to facilitating research focused on tumours with specific biological characteristics and/or in a critical location.
- Developing instruments for motion management in hadron therapy.
- Developing novel adaptive treatment planning, including protocols to combine different irradiation modalities.
- Developing technical solutions to reduce the size and costs of gantries.

Transnational Access (TNA)

The Transnational Access, was led by Jürgen Debus from the University Hospital of Heidelberg, allowed researchers from all eligible countries to perform clinical and experimental research, as well as to receive clinical training and education, at the recently opened ion therapy facilities - Heidelberg Ion-Beam Therapy Centre (HIT) in Germany and in CNAO (Pavia) in Italy. Beam time was allocated to external researchers through a review committee, which assessed the scientific impact of the proposed research project. A unified application system ensured that each researcher applying for beam time was directed to the facility best suited for his/her needs and obtained hands-on training.

Networking activities

This pillar was led by Manjit Dosanjh from CERN and focussed on communication, interaction and interdisciplinary discussion among the 20 partners and with the external world as well as dissemination of the project results to the wider community. Networking Pillar also organized a series of one-month training courses at HIT and CNAO for medical doctors and medical physicists who are either working in one of the planned European hadron therapy facilities or who just want to update their knowledge in the field.

ENVISION: European Novel Imaging Systems for Ion Therapy http://enlight.web.cern.ch/projects/envision

HT requires the state-of-the-art medical imaging techniques, not only prior to the treatment but ultimately also in real time, while the dose is being delivered, in order to provide fast feedback to the treatment planning system. In fact, uncertainties in the actual range of the particle beam inside the patient and factors related to the patient set-up or dose calculation may lessen the inherent accuracy of particle therapy.

Therefore, an important component in HT is quality assurance *during* treatment, which requires advanced medical imaging techniques. For this reason, the European Commission funded a 4-year project called **ENVISION** (European NoVel Imaging Systems for ION therapy) coordinated by Manjit Dosanjh (CERN). Launched in 2010, ENVISION included fifteen research centres and one industrial partner, whose purpose was to improve quality assurance tools for hadron therapy.

ENVISION addressed the crucial challenge of quality assurance during hadron therapy: making sure that the therapeutic beam is delivered at exactly the right place, at the right moment. The project aimed at developing solutions for real-time non-invasive monitoring and response to moving organs, quantitative imaging, precise determination of delivered dose, and fast feedback for optimal treatment planning.

The prompt-gamma-based proton range verification camera now being tested for clinical application by the OncoRay group at Dresden and IBA had its roots in the ENVISION and ENTERVISION projects, http://medicalphysicsweb.org/cws/article/research/64185 [22].

ENTERVISION: European training network in digital medical imaging for radiotherapy http://enlight.web.cern.ch/projects/entervision

Additionally, ENVISION served as the training platform for ENTERVISION, a Marie-Curie Initial Training Network aimed at educating young scientists from different disciplines like physics, medicine, electronics, informatics, radiobiology, and engineering in online 3D digital imaging. ENTERVISION brought together ten academic institutes and research centres of excellence and one industrial partner and was coordinated by Manjit Dosanjh (CERN). Starting in 2011, the ENTERVISION Marie Curie Initial Training Network trained fifteen young researchers on topics ranging from in-beam Positron Emission Tomography or Single Particle Tomography techniques, to adaptive treatment planning, optical imaging, Monte Carlo simulations and biological phantom design.

In addition, the researchers took part in the network-wide training events and training courses which served the dual purpose of educating them and of creating occasions for them to meet, connect with each other and establish an extensive professional network with the leading experts in the field as well as benefiting from the involvement in the annual ENLIGHT meeting. A number of highly valuable and interesting results were obtained within the framework of ENTERVISION, as demonstrated by numerous publications, posters, oral presentations in international conferences and journals. The researchers took part in the European Researcher's Night programme and in 2013, ENTERVISION was chosen as 'a success story illustrating the good use of European funds for research' and 'as a flagship project for Marie Curie Actions for the promotion of the H2020 programme, as a so-called "gold project"' [23].

The future of ENLIGHT

In 2015 on the occasion of the ENLIGHT annual Krakow meeting one session of this meeting was devoted to an open discussion among the ENLIGHT members on the challenges and way forward, both in discussing the need for continuation of the network and of scientific priorities. There was clear agreement on the need for such a broad umbrella organization, which is highly appreciated by the hadron therapy stakeholders and is admired also outside Europe. Education and training was underlined as another important future activity for ENLIGHT. An extended leadership support structure through a multidisciplinary advisory board was introduced to support the successful development of ENLIGHT.

It is clear that the focus of R&D for hadron therapy has shifted since the start of ENLIGHT, if only for the simple reason that the number of clinical centres (in particular for protons) has dramatically increased. Also, while technology developments are still needed in order to ensure safer and more cost-effective treatment, proton therapy is now solidly in the hands of industry.

From the clinical standpoint, the major challenge for European particle therapy in the coming years will be to catalyse collaborative efforts in defining a roadmap for the design of clinical protocols and trials which address the impact of advanced hadron technology and biological efficacy on disease outcome, morbidity and quality of life studying in detail the issue of RBE. This requires intensive collaboration in Europe facilitated by ENLIGHT together with the European Particle Therapy Network (compare this issue) and should also take into account research (infrastructure) work as performed e.g. in ULICE (see e.g. WP2 and WP3 as outlined in the ULICE paper in this issue). Concerning technology developments, efforts will continue on quality assurance through imaging and on the design of compact accelerators and gantries for ions heavier than protons. Information technologies will take centre stage, as data sharing, data analytics, and decision support systems will be key topics.

At the end of 2017 CERN decided to launch under the leadership of Maurizio Vretenar and Alessandra Lombardi – and in collaboration will all the European interested Institutions – a study, called PIMMS2. Twenty years after PIMMS, this new Proton Ion Medical Machine Study has the choice of many novel techniques for both accelerating carbon and other ions and design "compact" superconducting gantries. As far as the accelerators are concerned the main options are fast cycling synchrotrons, superconducting synchrotrons and linear hadron accelerators.

Education and training of young professionals

Training of the new generation of scientists has always been an essential component of ENLIGHT, and its importance is growing with the number of facilities: these require more and more trained personnel, and professionals highly skilled in their specialty will have to become familiar with the multidisciplinary aspects of hadron therapy. Due to the limited number of comparable centres in the world, most of those people cannot be found on the market but have to be educated and developed. For radiation oncologists and medical physicists pre-existing expertise in advanced photon therapy is desirable and should be supplemented by specific training in hadron therapy, e.g. hand on trainings in active particle facilities [24].

Since 2015 – following the request from the ENLIGHT community – training courses are held in connection with the Annual ENLIGHT meeting; participation is free of charge and training and lectures are generously offered by the ENLIGHT experts. The goal is to provide a broader view on selected topics within this multidisciplinary field. The lecturers explore the topics both from the medical perspective and the physics and biology perspective.

A sustainable future

Following the successful tradition of ENLIGHT for 15 years and beyond (EPTN), the annual ENLIGHT meeting will remain a cornerstone in the coming years. The meeting will continue to comprise major issues of actual interest from physics and technology, medical physics, radiobiology and clinical medicine. Likely there will be a shift to more applied clinical research topics related to the growing experience in the evolution of particle centres and corresponding expanding clinical research. The annual meeting will hopefully grow further together with the regular meetings of the EPTN, maybe even through joint meetings in the future, for the 2018 ENLIGHT meeting at UCL in London EPTN will be held immediately after ENLIGHT: these joint meeting may optimize the interaction of ENLIGHT with the medical community managing cancer patients.

Training will be a major focus in the coming years, as the growing number of facilities require more and more trained personnel: the aim will be to train professionals who are highly skilled in their speciality but at the same time are familiar with the multidisciplinary aspects of hadron therapy.

The need for funding for the annual meeting and the addition of education and training resulted in presenting a project to the CERN & Society Foundation

http://giving.web.cern.ch/content/enlight-training

The project has just been approved, giving the opportunity for the network to be self-sustaining and for the participants to collaborate, share knowledge, innovate and reinforce the education and training the future generation. Being included as a CERN & Society project, a new chapter has been opened for ENLIGHT and its' community – the benefits lies not only in the reinforcing of the hadron therapy field with qualified multidisciplinary groups of experts but especially in helping young scientists from around the world to flourish in the future [25].

Acknowledgements

We would like to thank the large group of colleagues and researchers who have participated in the framework of the ENLIGHT network and the EU funded projects ever since the network was founded. The members and their institutions have all contributed in many aspects of developing and promoting hadron therapy to ensure the success of the network. The senior ENLIGHT members have generously given their time to guiding and training the young generation of researchers especially in the context of the PARTNER and ENTERVISION project where training was key to the projects' success and a condition for the EU funding. Over the last 15 years the annual ENLIGHT meeting has been hosted by member institutes all over Europe, which would not have been possible without the members commitment and host support.

We would also like to thank Evelyn Chimfwembe from the ESTRO office and the newly appointed ENLIGHT Advisory Committee (2016): Jacques Balosso (Grenoble and Caen, France), Stephanie Combs (TUM, Munich, Germany), Marco Durante (TIFPA, Trento, Italy), Piero Fossati (MedAustron, Austria), Bleddyn Jones (Oxford, UK), Pawel Olko (IFJ, Krakow, Poland), Katia Parodi (LMU, Munich, Germany) and Richard Pötter (MUV, Vienna, Austria) for their time, expertise and support to the community which continues to flourish.

ENLIGHT funded by the European Commission FP5, Thematic Network, QLG1-CT-2002-01574, 2002–2005.

PARTNER was funded by the European Commission, FP7 People (Marie Curie) Programme, under Grant Agreement No 215840, 2008–2012.

ULICE was co-funded by the European Commission, FP7 Capacities Programme, under Grant Agreement no 228436, 2009–2014.

ENVISION project was co-funded by the European Commission, FP7 Cooperation Programme, under Grant Agreement N. 241851, 2010–2014.

ENTERVISION project was funded by the European Commission within the FP7 People (Marie Curie) Programme, under Grant Agreement No 264552, 2011–2015.

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