IMI2 Project 101005122 - DRAGON

The RapiD and SecuRe AI enhAnced DiaGnosis, Precision Medicine and Patient EmpOwerment Centered Decision Support System for Coronavirus PaNdemics

WP1 – Management

D1.1 Project Charter

Lead contributor	P7 OncoRadiomics (ONCO)
Other contributors	P10 European Respiratory Society (ERS)
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Deliverable type	Report
Dissemination level	Public

DRAGON project charter

Contents

1. Executive summary

This document is aimed at all DRAGON consortium members as well as collaborators and external contributors. Additionally, this is a public document which can provide insight into the operation of the DRAGON project. This project has received funding from the Innovative Medicines Initiative 2 Joint Undertaking (JU) under grant agreement No 101005122. The JU receives support from the European Union's Horizon 2020 research and innovation programme and EFPIA. More information is available at: https://www.imi.europa.eu/.

This document describes the consortium principles regarding project progress and execution, day-to-day communication, outreach, as well as administrative details and management structures. These aspects enclose the fact that established agreements and deliverables are completed in a timely manner and within budget. Common practices are outlined and detailed information referring to project related documentation, including layout and logos. Furthermore, an overview of the project and the related WPs is provided.

The general principles for the project execution are defined in more detail in the DRAGON Grant Agreement (GA), the Description of the action (DoA) and the Consortium Agreement (CA). The project Handbook does not replace any of these established agreements, nor does it replace any of the EU guidelines for project implementation and documentation.

Overall, this handbook shall be used as a guide by all consortium partners and members. It will help to stick to best practices and lead DRAGON to its foreseen and desired success.

2. DRAGON project overview

1.1. Problem

Diagnosing COVID-19 and, crucially, predicting how the disease will progress in different patients, remains a challenge. The DRAGON project aims to use artificial intelligence (AI) and machine learning to develop a decision support system capable of delivering a more precise coronavirus diagnosis and more accurate predictions of patient outcomes.

1.2. Objectives

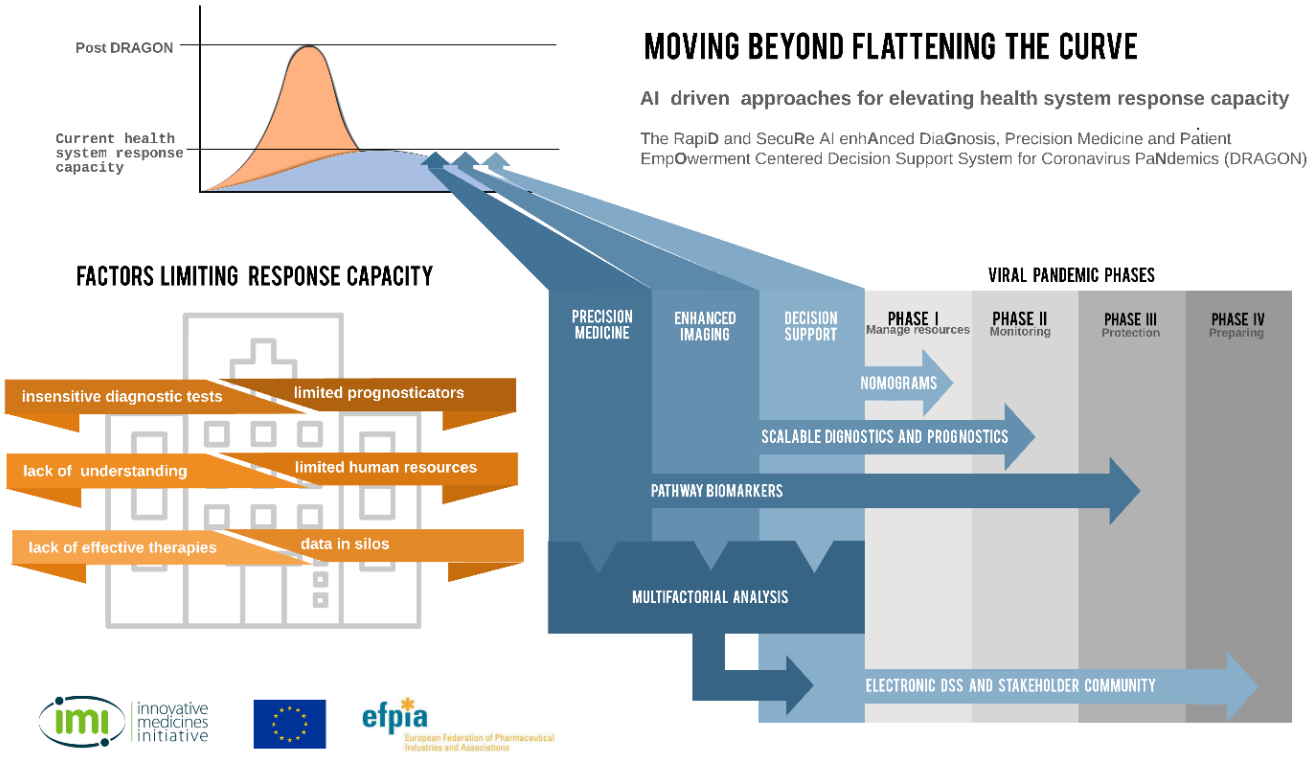
- Deliver scalable *diagnostic* and *prognostic* models based on imaging that are more efficient and accurate for supporting medical decision making and resource planning.
- Accelerate new therapy development by developing a *precision medicine approach* that adds molecular profiling and AI enhanced analysis to the multi-faceted scalable diagnostic and prognostic models.
- Deploy a *federated machine learning system* that will support fast track innovation by enabling continued data driven improvement while expanding the innovation capacity of this and other initiatives by providing a means to efficiently share and analyze data at scale.
- Engage stakeholders in the development of a *patient empowerment centered decision support system* that considers the entire patient journey and incorporates the outputs of the first three objectives.

1.3 Partners

Partner #	Legal name	Short name	Role	Country
1	Universiteit Maastricht	UOM	Coordinator	NL
2	Thirona BV	THIRONA	Partner	NL
3	Biosci Consulting BVBA	BIOSCI	Partner	BE

4	Imperial College of Science Technology and Medicine	ICL	Partner	UK
5	CDISC Europe Foundation	CDISC	Partner	BE
6	Universita Delgi Studi di Firenze	UNIFI	Partner	IT
7	Oncoradiomics	ONCO	Project Lead	BE
8	The medical Cloud Company	MEDC2	Partner	BE
9	TOPMD Precision Medicine LTD	TOPMD	Partner	UK
10	European Respiratory Society	ERS	Partner	CH
11	European Lung Foundation	ELF	Partner	UK
12	Department of Health (UK)	PHE	Partner	UK
13	The Chancellor Masters and Scholars of the University of Cambridge	UCAM	Partner	UK
14	Owlstone Medical Limited	OWLSTONE	Partner	UK
15	The University of Liverpool	UNILIV	Partner	UK
16	University of Southampton	SOTON	Partner	UK
17	Centre Hospitalier Universitaire de Liege	LIEGE	Partner	BE
18	Universita Delgi Studi di Parma	UNIPR	Partner	IT

1.4 Visual graphic



1.5 Key Impact table

Key Impact	Success metrics
Fast track development of diagnostics	Development of nomograms in 2 months. DRAGON decision support system being used in at least 30 centers
Fast track development of therapeutics	Identification of subclusters of patients that are not evident using clinical parameters leading to at least two biomarker/stratification strategies. Adoption of the decisions support system, *MyClinicalTrial*, by at least 5 different clinical studies.
Contribution to preparedness for pandemics	Federated machine learning system in use by at least 20 different centers with the ability to rapidly add more enabling the use of machine learning and data at scale. At least 5000 users of the decision support system's educational and informational features.
Significant impact on global health	Use of the nomogram and/or the decision support and the federated machine learning system on five continents.
Combining of public and private funds and contributions	Achieve >30 joint publications of public and private industry partners within 5 years after the project period.

1.6 WP short summaries

Table 1 Lead and participating partners per WP

WP	WP Lead partner	Participating partners
WP1 Management	ONCO	BIOSCI, UOM
WP2 Patient empowerment through decision support systems	MEDC2	BIOSCI, ERS, ELF
WP3 Rapid scalable radiological diagnosis	THIRONA	UOM, ICL, UNIFI, MEDC2, TOPMD, UCAM, LIEGE, UNIPR
WP4 Rapid scalable radiological prognosis prediction	THIRONA	ICL, ONCO, TOPMD, UCAM, LIEGE
WP5 Privacy-preserved and self-adaptive imaging biomarker extraction	ICL	CDISC, UCAM, LIEGE
WP6 Multifactorial analysis	UOM	UNIFI, MEDC2, TOPMD, PHE, UNILIV, SOTON, LIEGE
WP7 Technical development of federated machine learning system	ONCO	ICL, CDISC, UNIFI, LIEGE
WP8 Fast track clinical studies	UOM	ICL, CDISC, UNIFI, ONCO, MEDC2, TOPMD, UCAM, OWLSTONE, UNILIV, LIEGE, UNIPR
WP9 Accelerated regulatory approvals	ONCO	THIRONA, ICL, CDISC, MEDC2, TOPMD
WP10 Dissemination and communication	ERS, ELF	All partners
WP11 Sustainability	BIOSCI	ONCO

1.6.1 WP1 Management

The aim of this work package is to ensure the conduct of an efficient and productive consortium project by facilitating cohesiveness across the consortium through a high level of interaction. This is meant to maximize the value of public/private partnership. This work package will also ensure that the governance of the project is followed and that the consortium adheres to ethics principles and manages the IP produced.

1.6.2 WP2 Patient empowerment through decision support systems

The biggest challenge during a viral pandemic is the marshalling of resources. Viral pandemics are crises that affect an entire society and collaboration on a societal level is needed not only for social distancing but also for the management of the illness and for driving innovation. The main objective of this work package is to enable the empowerment of citizens/public to be a societal level resource that works together with other stakeholders to help diagnose, prognosticate to optimize care. It is also about empowering citizens to participate in collection of data to improve clinical care and enable the development of precision medicine approaches that will increase the usefulness of the many new therapies under development. Patient empowerment is a process to help people gain control, including people taking the initiative, solving problems, and making decisions. A striking aspect of the SARS epidemic (2002-2004) was the major role fear played in the economic and social consequences. This emphasizes the need of helping patients to gain control and reduce anxiety. As such this work package is where the outputs of the other work packages are collected together into a multi-stakeholder decision support system among others aimed at patient empowerment.

1.6.3 WP3 Rapid scalable radiological diagnosis

This WP aims to will deliver a CE marked software suite as a medical device based upon existing solutions currently successfully deployed in China. We will (re)train and validate machine learning models that learn from European data, from approximately 500 coronavirus (PCR positive) Belgian patients, with varying quality and acquisition protocols. The models will then be refined using British, Dutch and Italian datasets that are, or will be, available in short-term. The trained model will be generalizable, with minimum effort, to data/patients from other regions.

An array of triage scenarios will be considered with the clinical presentations of the incoming patient, severity of the symptoms, if any; availability and results of PCR/CRP tests, if available; evidence of contracting, underlying pre-conditions. Each of these patients will have the options of being prioritized for further testing, for infectious disease wards or for ICU. In this WP, classification models will be developed on both CT and CXR images for these scenarios where they shall play a role: CXR for fast triage of patients in the emergency department (ED) and patient follow-up, CT for prioritizing ICU for patient with severe symptoms and positive RT-PCR results or for those with positive RT-PCR and negative CXR; and active surveillance scheduling for patients with positive tests and pre-conditions. Data availability and suitability for each of these above classification tasks are described in individual tasks

1.6.4 WP4 Rapid scalable radiological prognosis prediction

This WP aims to analyze the “in-hospital” longitudinal imaging data (both CXR and CT), together with other clinical parameters, to predict rapid disease progression within the next 72 hours. This is of importance in planning emergency healthcare services such as ICU space and ventilating equipment, as well as of epidemiological value such as fatality prediction. Using CT as a frontline diagnostic tool during the breakout, as rolled out in China, will be evaluated in this WP. Machine learning based prediction tools will be developed to assist these decision making and resource prioritization. In addition, combining information extracted from sequential CXRs in their first 24-48 hours following admission with their CT scan data during model training will improve prognostic capabilities of our machine learning model further. However, defining clinical progression with this new disease is not trivial. In this WP, we propose to use available information in the retrospective data as a surrogate of the clinical end-points. In particular, the clinical history of individual patients will be collected and analyzed to provide consensus labels for the machine learning tasks described in this WP. T4.2 provides a plan for this task, which will be a key to the success of the WP and potentially benefit much

wider understanding and management of the disease.

1.6.5 WP5 Privacy-preserved and self-adaptive imaging biomarker extraction

In this WP, we will investigate how to optimally adapt image quality and image information content for machine/radiomics use (as compared to visual inspection by a human). An iterative process of development, testing, assessment will be followed to deliver a validated and refined model closely linked to the aims for data harmonization for the multicenter and multi-scanner studies of the CXR/CT images acquired for the coronavirus patients. Based on the consensus clinical protocol recommendation for image acquisition and synthetically harmonized images, image acquisition will be iteratively tailored to each grading of the coronavirus patients to facilitate the most important quantitative imaging biomarkers feature extraction. To this end, image acquisition will be systematically evaluated and varied to approach the optimal acquisition scenario for the dominant radiomics feature, leading to improved standardization of the input images to the repository of the project.

1.6.6 WP6 Multifactorial analysis

The primary aim is to conduct a multi-factorial analysis to improve diagnosis of at-risk patients and to enable precision medicine approaches to patient care and new therapy development. Combining risk factors from multiple types of data (e.g., demographic, laboratory results, imaging) using advanced AI-enabled analysis, maximal value will be extracted from available patient information. This work package is also about developing mechanistic insights into the clinical course of the disease, the conduct of immunological analyses, and molecular profiling. This type of data is essential for targeting new therapies to subpopulations mostly likely to benefit and for providing mechanistic insights if a clinical trial fails. All predictive models developed in this WP will be available through a website (https://covid19risk.ai/), freely accessible for research use, enabling swift dissemination (key requirement for a rapidly evolving field of research such as COVID-19).

1.6.7 WP7 Technical development of federated machine learning system

OncoRadiomics has developed DistriM (distributed machine learning) for radiology in oncology purposes . The purpose of DistriM is to continuously extract and apply updated knowledge from routine clinical care data rather than be exclusively ‘locked’ to the original clinical trial evidence. DistriM achieves this in line with the recommendations outlined by the FDA white paper on AI software as a medical device. Specifically in this project, the objective is to set up and optimize infrastructure for federated machine Learning for radiology in respiratory / coronavirus. DistriM delivers individual privacy-by-design for data management / processing and is transparently auditable by a blockchain. This WP is completed successfully once the federated machine learning infrastructure is set up, optimized, validated, and clinically deployed. DistriM will be populated with data from hospitals, research institutes, databases and continuously improved models are learned from these data on a regular basis. Specifically, an implementation supporting distributed learning for standardized imaging biomarker extraction, and for facilitating distributed radiomics and deep learning in medical image analysis will be developed, which will be utilized and integrated in all others WPs.

The hardware that will hold the data at source generated by clinics with DistriM will be set-up and the appropriate learning connectors will be established. User data is privacy sensitive, hence to learn models in the desired distributed learning approach, the project will utilize secure data storage, data access, and learning mechanisms.

AI that takes a centralized approach is hampered by legal, ethical, administrative and political issues when privacy sensitive patient data is required. We therefore champion the Distributed Learning approach as a recent advancement to solve the issues surrounding centralized learning and the utilization thereof . In the distributed learning approach, the paradigm reverses and the AI is brought to the data, wherever it is stored. The AI is trained at that data store and then the AI is sent back to a central location, rather than gathering all the data in one place. At the central learning coordinator, the AI trained individually at the separate data stores are integrated into a single model. Therefore, privacy sensitive data never leaves the data stores and are obscured to the researcher while data are available to the learning application. The DistriM solution of partner Oncoradiomics is a thoroughly

tested solution currently deployed and in operation for radiology in oncology in Belgium, Germany, the Netherlands, and the US.

1.6.8 WP8 Fast track clinical studies

Linking into other coronavirus IMI (or other) projects. With the knowledge and tools generated in the previous work packages provide a platform for broad usage in clinical trials, testing an aerosol sampling device, and providing samples for the precision medicine approach.

1.6.9 WP9 Accelerated regulatory approvals

This work package details the work necessary to rapidly develop, certify, and deploy clinically viable fit for purpose solutions (such as a patient decision aid App or an AI model prospectively validated that can automatically detect and classify coronavirus patients in a variety of imaging settings). Below is a schematic overview of the regulatory frameworks in the EU and US.

1.6.10 WP10 Dissemination and communication

To ensure that the impact of DRAGON is maximized, this work package is exclusively focused on dissemination of the results to its end-users as well as communication to a wider public. ERS and ELF will lead these activities. However, it will require the engagement of all partners not only for generating the communication material but as well to ensure appropriate dissemination through the necessary channels. This will be instrumental to ensure that DRAGON's results and tools are used in clinical practice.

1.6.11 WP11 Sustainability

This work package will work to develop a plan to sustain the collaboration and the resulting assets after the funding period. The longer term impact will be substantially increased if this project leads to a sustained effort that continues to build over time.

1.7 Best possible outcome scenario

The most successful response to a pandemic extends beyond containment and delaying spread; it increases the capacity of the entire health, research and innovation ecosystem. The primary concern for healthcare providers is that resources will become overwhelmed, leading to otherwise, preventable deaths.

The underlying objective for this project is the concerted effort to improve the speed and scalability of diagnosis and prognosis by:

- Applying AI to imaging,
- Adding the ability to predict outcomes early in the clinical course, e.g. with multifactorial nomograms available on www.covid19risk.ai and
- Empowering citizens and patients to participate in their diagnosis, care, monitoring (e.g. for long COVID) and preparedness with digital health tools

The best possible outcome scenario would be all tools completed with regulatory approval, all the trials completed allowing for the completion of the three above-mentioned objectives. Finally our tools being widely used beyond the DRAGON consortium.

1.8 Foreseen risks

Epidemic subsides or explodes: Some the objectives depend upon obtaining samples prospectively a reduction or explosion in the pandemic may create barriers for collecting samples.

- Mitigation Measures: Much of the planned work can be conducted using existing data and the federated machine learning system makes it easy to connect to other sources of data where molecular profiling has been conducted. The aerosol collection devices could still be tested in a clinical setting looking for other viruses or the flu. Response: identify sources of appropriate data and refocus aerosol collection on other types of virus

- Linked to WPs: 3, 4, 6, 8

Brexit: The consortium has UK partners

- Mitigation measures: The current Brexit agreement does define that UK partners will be eligible for funding until the end of the programme. The UK government has also always been committed to ensuring that UK partners can participate in EU research. Response: Realign tasks and responsibilities and seek additional partners if necessary
- Linked to WPs: All

Sites not willing to set up federated machine learning: In order to set up federated machine learning sites will have to configure their local datasets

- Mitigation measures: The plan to develop a stakeholder community will help to increase the value they will receive for sharing data. The ability to analysis broader array of datasets is attractive to researchers Response: We will investigate the reasons for refusal an either offer further resources and/or deepen the opportunities for the sites to take part in joint research
- Linked to WPs: 3, 4, 5, 6, 7, 8

Public health hazard due to increased radiation exposure from clinical radiographic examinations.

- Mitigation measures: The success of DRAGON with respect to our imaging AI solution will always be appropriately constrained by good governance in radiology (e.g., recommendations for use or not of imaging by the ACR, etc.). Response: Our imaging AI solutions will be optimized in line with low dose scanning protocols. A recent study suggests that low dose CT imaging is safe and supports the use in general screening of the public for lung cancer.
- Linked to WPs: 3, 4, 5, 6, 7, 8

Data collected not sufficient to predict clinical outcome**:** The clinical outcomes may be too variable and the data insufficient to have an impact. For example if myocardial involvement appears to be a major determinant and no data is collected to assess myocardial involvement

- Mitigation measures: The plan is to begin with existing data which is the rationale behind including the partners from China. This will provide the opportunity to narrow to those patients where it is most likely to be able to predict clinical outcome Response: If the initial efforts to predict clinical outcome fail, a narrowing and increased selectivity will be applied and particular emphasis will be placed on the molecular profiling
- Linked to WPs: 3, 4, 5, 6

Accessing and processing patient level data from (European) clinical centers

- Mitigation measures: Development and deployment of DistriM (Distributed machine learning) as federated machine learning system. Individual privacy-by-design data management and processing enabling data collaboration with clinical environments, ensuring personal patient level data never leaves the participating clinic. Thus mitigating the risk
- Linked to WPs: 5, 7

2 Operations

2.1 Expectations for partners

- Participate in consortium meetings
- WP meetings – At least one representative from each participating partner should be present at each WP meeting
- Timely reporting (See section 3.1 for the deadlines of reporting periods)
- Bring problems to the wider group early

- Problems should first be discussed at the relevant WP meeting. If a problem does not relate to any one WP, email project manager (nina.flerin@radiomics.bio) to determine the best course of action to address concerns.
- Seek early input from a wide group (i.e. WP) on the 1st draft, outline, prototype
- Follow Responsible Research and Innovation principles based upon the RRI charter
- Keep confidential information confidential
- Proactively identify publications and adhere to the Publication Policy (to be available in February 2021)

2.1 Management structure

The approach to innovation management will emphasize the value of multi and trans-disciplinarity. A guiding principle is that the project should deliver on individual partner priorities as well as the overall objectives. It will operate as a true collaboration where partners work together to solve problems and develop new plans. The envisioned structure of the project and the consortium bodies are described below.

2.1.1 Project Coordinator (PC) - University of Maastricht

Act as a central point of contact between the DRAGON partners and the IMI project officer in particular regarding the management of the grant. Responsible for submission of deliverables and progress reports, as well as expense reports and the distribution of funds to partners.

The Coordinator acts in close collaboration with the Project Leader. In particular, the Coordinator is responsible for:

- Coordinating and managing of the Grant;
- Central point of contact for IMI2 JU for its administration, meaning that the Coordinator is responsible for:
  - receiving all payments made by the IMI2 JU;
  - distributing the IMI2 JU funding to partners eligible to receive IMI2 JU funding;
  - ensuring that all the appropriate payments are made to the partners eligible to receive IMI2 JU funding without unjustified delay;
  - keeping accurate accounts of the amounts of, and distribution of, IMI2 JU funding to partners eligible to receive IMI2 JU funding;
  - informing the IMI2 JU of the distribution of IMI2 JU funding, the amounts and the dates of such transfer to partners eligible to receive IMI2 JU funding;
- after consultation with the Project Leader monitoring that the Action is implemented properly;
- acting as the intermediary for all communications between the partners and IMI2 JU, in particular, when relating to the administration and management of the Grant;
- request and review together with the Project Leader, any documents or information required by IMI2 JU and verifying their completeness and correctness before submission to IMI2 JU;
- including the individual financial statements from each partner receiving JU funding to verify consistency with the Actions tasks and in requested format;
- verifying that other requested documents than the financial statements are submitted by the Beneficiary and in requested format;
- submitting reports on the Deliverables and other requested reports to the IMI2 JU following prior review by the Project Leader.

2.1.2 Project Leader (PL) - Oncoradiomics

The Project Leader is in charge of the overall scientific and Action related governance and will perform a number of duties as part of the general management of the Action and will act in close collaboration with the Coordinator. In particular, the PL shall be responsible for:

- Ensuring strong scientific coordination and collaboration between all partners
- Rreviewing Deliverables and reports before submission by the Coordinator to the IMI Project officer

- Being informed on and collaborate with the Coordinator on its monitoring activities and the adoption of appropriate internal measures to ensure the Beneficiaries are on track with their obligations as well as with respect to budget, time, Deliverables and high scientific quality.
- Advising the Coordinator on the allocation and distribution of the IMI2 JU financial contribution among Beneficiaries eligible to receive IMI2 JU funding, in accordance with the IMI2 Grant Agreement and this Consortium Agreement;
- Acting as the key contact and intermediary for all scientific and Action governance issues including external communications, other than the ones entrusted directly to the Coordinator (e.g. with bodies like EFPIA and its internal working groups); overseeing the technical, financial, technological (innovation impact) and ethical aspects; this shall be done jointly with the Coordinator;
- Coordinating the drafting and negotiation of legal agreements which are needed for implementing the Action, in collaboration with the partners;
- Working with partners to prepare and negotiate any non-disclosure agreements that may be required, unless covered by the Mandate pursuant to Clause 11.5.

The two main points of contacts at the PL are:

- Sean Walsh (sean.walsh@radiomics.bio), Chief Scientific Officer
- Nina Flerin (nina.flerin@radiomics.bio), Project manager

2.1.3 Management Board

- Co-Chairs:
  - Philippe Lambin, Coordinator - Maastricht University
  - Sean Walsh, Lead partner - Oncoradiomics
- Membership:
  - Eva van Rikxoort (Thirona)
  - Julien Guiot (CHU LIEGE)
  - Guang Yang (ICL)
  - James Schofield (TOPMD)
  - Pippa Powel (ELF)
  - Brice van Eeckhout (MEDC2)
- Responsibility and operating principles: A small committee of partners that will represent the different major aspects of the project and will work with the Coordinator to make strategic decisions, assemble the reports, and manage conflicts. The Coordinator making the deciding vote in the event of a tie vote. The members of the Management Board were elected in December 2020. An email was sent out to PIs from all DRAGON partners to ask for nominations to the board. Members of the management board will meet every quarter via teleconference. First meeting will be scheduled in January 2021.

2.1.4 Project Integration Team

- Chair: Scott Wagers (Biosci)
- Membership:
  - WP1: Nina Flerin (ONCO), Sebastiaan Huntjens (UOM)
  - WP2: Brice van Eeckhout (MEDC2)
  - WP3 & 4: Eva van Rikxoort, Jean-Paul Charbonnier (THIRONA)
  - WP5: Guang Yang (ICL)
  - WP6: Avishek Chatterjee, Philippe Lambin (UOM)
  - WP7: Sean Walsh (ONCO)
  - WP8: Cary Oberije, Philippe Lambin (UOM)
  - WP9: Sean Walsh (ONCO)
  - WP10: Celine Genton, Kathryn Forrest (ERS), Pippa Powell (ELF)

- WP11: Scott Wagers, Ninja Hoen (BIOSCI)

- Responsibility and operating principles: Each WP lead and other key individuals will make up the Project Integration Team. The concept is to engage all those who are active in the project. The PT will meet at least twice a month by conference call. The purpose will be to present reports on progress for each WP and discuss and decide upon cross-WP issues that are blocking progress. An integrative thinking process will be used to characterize issues and to leverage the breadth of expertise to develop creative solutions. In the even that issues cannot be resolved at the level of the WP Integration team, they will be brought to the Management board for further discussion and vote.

2.1.5 WP teams

- Chair: The chair of individual WPs appointed within the team at the WP Lead partner (see Table 1 for the list of Lead and participating partners per WP)
- Membership: Team members from participating partners who are directly involved in the work of the different tasks in the WP. Each task in the WP should have an appointed lead from the relevant partner organization. This contact is assigned to the task, deliverable and/or milestone in the DRAGON Teams environment project planner application.
- Responsibility and operating principles: The partners will meet regularly within the WP working groups. The frequency of this meeting will be determines as needed by the WP lead and can vary over time depending on the work process within the WP. The WP lead will also be responsible for all the organization of WP meeting as well as keeping of relevant notes. Members should raise any questions or difficulties to the WP lead who should either provide resolution or bring up the problem for discussion with the Project integration team.

2.1.6 Ethics board

- Chair: Scott Wagers (BIOSCI)
- Membership: TBD
- Responsibility and operating principles: The mission of the Ethics Board (EB) is to assure ethical conduct of the project in terms of informed consent, data protection and privacy, and research integrity. The board will consist of 3 internal and 3 external members. The external members will decide upon issues that relate to consortium partner misconduct. A process for anonymous reporting of issues to the external Ethics board members will be established. A Responsible Research and Innovation (RRI) charter will be developed by the EB that will be signed by all consortium members

2.3 Meetings

The below outlined approach allows for constant contact amongst consortium members linking all partners closely together. In case of complications at any point and if assistance is needed feel free to contact the project manager (nina.flerin@radiomics.bio)

2.4.1 Consortium meetings

Consortium meetings will be held on a yearly basis with the first consortium meeting organized at month 6. Depending on the circumstances and the state of the COVID-19 pandemic, these meetings will take place in person or by teleconference. The organization and leadership of these meetings is the responsibility of the Lead partner. The goal of consortium meetings is to assess project progress, foresee risks of delay and take necessary actions and decisions. The entire Consortium is invited to attend. The Coordinator, Lead Partner and at least one representative of each partner as well as WP leaders are required to attend. Individual WP progress will be presented by WP leaders and involved partners. The discussion in these meetings will be focused on the bigger picture of the project, celebrating its successes as well as learning from its shortcomings. Minutes will be shared with consortium and saved in the notes tab of the General channel in the IMI_Dragon Team.

2.4.2 WP meetings

WP meetings will be held at least monthly. The frequency of these meetings is at the discretion of the WP Lead and can vary based on the timeline of the project. Meeting minutes should be kept and saved in the relevant WP channel in the IMI_Dragon Team. The organization and leadership of the WP meetings is the responsibility of the WP Lead, however assistance from the project manager (Nina Flerin) can be requested.

2.4.3 Project integration team meetings

Project integration team will meet bi-weekly. Organization and leadership of these meetings is the responsibility of Scott Wagers (BIOSCI). Notes will be kept in using the designated Miro Board (also available as link in the Project integration team channel in the IMI_Dragon Team ("PIT whiteboard" tab). The agenda for each meeting will be sent in advance by email. Selected WPs will be selected as topics of discussion in order to limit the duration of the meeting to 1h.

2.4.4 Additional internal and technical meetings

Any additional meeting, e.g. regarding specific tasks, can be arranged directly by the members. These will very likely be held via conference call using the system of choice of all involved participants.

2.4.5 Management board meetings

Management board meetings will be organized and lead quarterly by the PL.

2.4 Internal Communications

Oncoradiomics, as the Dragon Project leader takes over the responsibility of the communication within the consortium,

University of Maastricht will be responsible for communications regarding any official interaction with IMI, such as amendments to the project and relating to the grant and consortium agreements.

The main channels between members should be via the IMI_DRAGON Microsoft Teams environment and the relevant channels. The chat option should be utilized in the individual channels of the IMI_Dragon Team as much as possible..

Documents relating to individual WPs should be saved in the files folder of the relevant WP channel. The WP channels are private with members added based on their participation in the WP. All final versions of documents should be saved in the General channel of the IMI_Dragon Team. The Team also has a corresponding SharePoint site. Instead of circulating documents via email, partners will be informed, once e.g. a new deliverable is added to the General Channel.

Many people may be working on a number of different projects and are likely to receive numerous emails every day, therefore, a standard subject title is proposed. This helps to quickly recognize the project related emails.

Project related emails should include in the subject title: 'DRAGON' and WP number (if applicable) followed by a more specific description of the subject, see below an example:

[Subject: DRAGON WP1 D1.1 Project charter – review request]

Furthermore, please cc the project manager (nina.flerin@radiomics.bio) in important email communications.

A project newsletter will be sent quarterly to all members of the consortium. The newsletter will include a list of important developments and achievements as well as any publications. The newsletter will also serve as a call for action on important questions where input is needed from the consortium. Lastly, it will include a reminder of the deliverables that are due in the following quarter.

2.5 Budget overview by WP

The complete overview of the budget for each partner by WP and by category (total EU contribution, direct cost/personnel, subcontracting, other direct cost, 25% indirect cost) is available in the general

channel of the IMI_Dragon Team (link to file in Microsoft TEAMS)

2.6 Contact list

The full list of contacts per partner as well as contact list per WP is available in the general channel of the IMI_Dragon Team (link to file in Microsoft TEAMS). If changes are needed to be made to the contact list please email the Dragon project manager from Oncoradiomics (nina.flerin@radiomics.bio).

To reach all members of the Dragon project (everyone on the contact list) you can email dragon@oncoradiomics.com

2.7 Collaboration support tools

A Microsoft TEAMS environment has been established by the lead partner Oncoradiomics. All project relevant files are saved in this Team and associated SharePoint folder. Everyone included in the contact list has been added to this Team.

The IMI_Dragon Team contains a private Channel per each WP to which relevant members from partner contributing to the WP have been added too. In addition there are 2 open channels.

Each Channel contains a Notes tab where all meeting notes are kept

There is a planner tab in the “General” channel. This planned includes all tasks, deliverables and milestones as well as their deadlines. Individual members from responsible partners have been assigned to individual tasks/deliverables/milestones. The members assigned should update on the status of the tasks.

A guide on how to use Teams can be found here. Some useful tips and trick to maximize the potential of the Microsoft Teams environment can be found here. In case further assistance is needed for the use of the collaboration support tools please contact the project manager (nina.flerin@radiomics.bio)

2.8 Conflict resolution

Any conflict should first be discussed withing the WP working groups. In the event that resolution is not possible at the WP level, the WP lead will bring the issue up for discussion to the Project integration team. If discussion at the project integration team does not yield a solution, the conflict will be brought to the Management board where the issue will again be discussed and finally proposed solutions will be put up to the vote. The Coordinator will make the deciding vote in the event of a tie vote.

3 Reporting

3.1 Reporting periods

There DRAGON project is divided into three reporting periods:

- Reporting period 1 – October 1st 2020 – September 30th, 2021
- Reporting period 2 – October 1st, 2021 – September 30th, 2022
- Reporting period 3 – October 1st, 2022 – September 30th, 2023

3.2 Periodic reports

In accordance with the Grant Agreement, the consortium shall submit a periodic report at the end of every reporting period (M12, M24, M36).

Periodic reports must be submitted by the coordinator within 60 days following the end of each reporting period :

- Periodic report 1 is due at the latest on November 29th, 2021
- Periodic report 2 is due at the latest on November 29th, 2022
- Periodic report 3 is due at the latest on November 29th, 2023

A periodic report template can be found on the H2020 website.

Periodic reports include a periodic technical report, as well as a periodic financial report.

The periodic technical report consists in turn of two parts; Part A and Part B:

3.2.1 Technical report part A

Part A is generated by the Funding & Tener portal's system. It is based on the information entered by the participants through the periodic report and continuous reporting modules of the electronic exchange system in the Funding & Tenders Portal. The participants can update the information in the continuous reporting module at any time during the life of the project. Part A contains:

- the cover page,
- a summary which can be used for publications by the EC,
- the answers to the questionnaire (covering issues related to the project implementation and the economic and social impact).

The project coordinator is responsible for part A with input from project leader..

3.2.2 Technical report part B

Part B is the narrative part that includes:

- Explanation of the work carried out by the beneficiaries,
- Progress overview towards the objectives of the action, including milestones and deliverables (defined in Grant Agreement Annex 1),
- In case of differences this report needs to address and include justifying explanations of differences between expected and actually carried out work, in accordance with defined deliverables/work plan,
- Detail the exploitation and dissemination of the results. If required, an updated "plan for the exploitation and dissemination of results" can be added to Annex 1.

WP leaders compile a report on their WP together with contributors in the WP and send it to the project coordinator, who consolidates the provided information and sends the complete periodic technical report to the consortium for review. The final approved version will be uploaded as a PDF document into the EC Funding & Tender Portal.

3.2.3 Periodic financial report

The periodic financial report contains:

- An individual financial statement per beneficiary, covering the entire reporting period.
  - Individual financial statements have to detail eligible costs for each budget category. Amounts not declared in individual financial statements will not be taken into account by the EC.
- An explanation of the use of resources and information on subcontracting (if any) and in-kind contributions provided by third parties (from each beneficiary, for the concerned reporting period)

A periodic summary financial statement is automatically created by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and includes the request for interim payment (expect for the last reporting period).

The PC will have a final check of the statements and accepts or revokes them and ask for clarifications and resubmission by the concerned partner(s), if needed.

If any of the partners fails to respect the deadlines, the PC will submit the Periodic Report on time. Missing data form one or more partners will not be regarded. This procedure ensures to avoid delays in payment of other partners. If an individual financial statement is not submitted for a reporting period, it may be included in the periodic financial report for the next reporting period.

Once the complete Periodic Report has been verified and deemed correct and complete, the Coordinator submits it to the EC participant portal.

3.3 Final report

As described in the Grant Agreement, and in addition to the Periodic report, a final project report will be delivered at the latest 60 days after project completion/the end of the last reporting period.

The final report must comprise:

- A technical report with a summary for publication. This should include:
  - An overview of results as well as exploitation and dissemination possibilities,
  - The conclusion on the action,
  - The socio-economic impact of the action.
- A final financial report, containing:
  - A final summary financial statement, automatically created by the electronic exchange system, consolidating the individual financial statements for all reporting periods and including the request for payment of the balance,
  - A certificate of the financial statement for each beneficiary, if requesting a total contribution of EUR 325,000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices.

3.4 Tips on eligible costs/ non eligible costs

The periodic report submitted by the Coordinator must include an individual financial statement from each beneficiary, for the reporting period concerned. This individual financial statement must include details of the eligible costs (unit costs, actual costs and flat-rate costs) for each budget category. A template for the individual financial statement can be found on the above mentioned H2020 periodic report website (Section 3.1). More information on the topic of eligible/non eligible cost can be found in Article 6 of the Grant Agreement.

3.5 Deliverable and milestone report templates

Dragon deliverable and milestone reporting templates have been prepared and are available in the "IMI_DRAGON" Teams "General" channel, "Reporting templates" folder. These templates should be used for all deliverables prepared. Milestone verification template should be used and any relevant proof attached in annex for all milestones completed.

The final documents to be uploaded to the H202 portal as deliverables will be saved in the "Deliverables" folder in the General channel of the IMI_Dragon Team.

The completed milestone verification forms are saved in the "Milestones" folder in the "General" channel of the "IMI_DRAGON" Teams.

A complete list of deliverables and milestones, including the due date and responsible contact is available in the project planner tab as well as in an Excel spreadsheet in the General Channel of the IMI_Dragon Team.

All final milestone and deliverables documents shall be named in the following manner:

IMI_Dragon_WPX_DX.Y for deliverables and IMI_Dragon_WPX_MY

3.6 Reviews of milestones

The partner responsible (as defined in the H2020 continuous reporting portal) should prepare the milestone verification form. Once completed the document should be sent to the project manager (nina.flerin@radiomics.bio) and the Coordinator (dragon-pm@maastrichtuniversity.nl). Upon review the final milestone verification forms will be saved in the "Milestones" folder of the "General" channel of the "IMI_Dragon" Team. The milestone will be marked completed on the H2020 Continuous reporting portal by the Lead partner.

3.7 Review of deliverables

The partner responsible (as defined in the H2020 continuous reporting portal) should prepare the

deliverable report using the Deliverable template (section 3.3). The document should first be reviewed by all contributing partners. Next the document should be sent to the Lead partner (nina.flerin@radiomics.bio) and the Coordinator (dragon-pm@maastrichtuniversity.nl), who will further distribute the deliverable for final review by the Management board. Upon review the final deliverable document will be uploaded and submitted on the H2020 continuous reporting portal by the Coordinator. Additionally, the file be saved in the "Deliverables" folder of the "General" channel of the "IMI_Dragon" Team.

3.8 Keeping records

Each partner must — for a period of five years after the payment of the balance keep records and other supporting documentation in order to prove the proper implementation of the action and the declared costs to be eligible. The documents need to be the original documents. Digital and digitalised documents are accepted if national law accepts these documents as originals.

The partners must keep the records and documentation according to their usual cost accounting practices and internal control procedures. There must be a track between the amounts declared, the amounts recorded in accounts and the amounts stated in the supporting documentation (audit trail).

Timesheets are required to be kept locally, at partner institutions. This will help to maintain complete records of time worked on the project. These time sheets can be kept in any desired format and should be in accordance with practices established at respective institutions. Partners are not required to submit time sheets, however they should be available for inspection upon request.

3.9 Payments

The following types of payments are foreseen:

- **Pre-financing at the start of the project:** Pre-financing funds remain EU property until they are "cleared" against eligible costs accepted by the European Commission. Pre-financing was already transferred to EuCanImage partners in October/November 2020.
- **Interim payment** following the approval of the periodic reports: After approval of the formal periodic reports an interim payment will be issued.
  - First Periodic Report: M1 - M12. Payment foreseen by M16 (depending on approval of the Periodic Report and consecutive payment by the EC).
  - Second Periodic Report: M13 - M24. Payment foreseen by M28 (depending on approval of the Periodic Report and consecutive payment by the EC).
- **Final payment** following the approval of the final report: The final payment will be transferred after the approval of the final report and consists of the difference between the calculated EU contribution (on the basis of the eligible costs) minus the amounts already paid.
  - Third and Final Periodic Report: M24 – M36. Final Payment foreseen by February 2024 (depending on approval of the Periodic Report and consecutive payment by the EC).

4. Dissemination & Communications

Partner ERS is responsible for Dissemination and Communication activities within DRAGON (WP 10) in close collaboration with ELF. They have developed a comprehensive Communications and Dissemination plan (D10.1) which will be updated periodically and is available to all partners in the General channel of the IMI_Dragon team along with other relevant documents such as the DRAGON logo and visuals as well as a copy of the IMI communications guidelines. As part of the Plan, partners should add their planned or potential dissemination and communication activities to the Excel MasterPlanner (or Annex IV) to facilitate planning as much as feasible. Here we provide a short overview of the main requirements from the IMI in terms of communicating about the project.

4.1 IMI Communications and dissemination requirements

All DRAGON partners – including their Communications department - need to be aware of the main IMI communication and dissemination requirements. In line with the Grant Agreement and the

"Communication guide for IMI projects", all communication activities and products on IMI projects (e.g. articles, project websites, presentations, flyers, press releases, social media, videos etc) must include the following elements:

- The EU emblem, IMI JU logo and EFPIA logos: these three logos can be downloaded from the IMI website in different formats. Please carefully refer to the "Communication guide for IMI projects" when using these logos.
- Link to IMI website: www.imi.europa.eu.
- Disclaimer: It should be made clear in the text and layout that the communication reflects the author's view and that neither IMI nor the European Union, or EFPIA, are responsible for any use that may be made of the information contained therein.
- The DRAGON logo and website link**:** the logo can be downloaded from the Teams DRAGON environment under the General channel and should be featured somewhere in the document/tool but not next to the EU emblem and IMI / EFPIA logos.
- Formal acknowledgement of IMI support (GA article 29.4): "*This project has received funding from the Innovative Medicines Initiative 2 Joint Undertaking (JU) under grant agreement No 101005122. The JU receives support from the European Union's Horizon 2020 research and innovation programme and EFPIA*". This statement relates to communication about the project and should be translated into the language of the communication product as much as possible. Specific acknowledgements sentences are available for different cases (e.g. patents, where space is limited, etc); please also refer to the Communications & Dissemination plan available in Teams.
- Please also refer to the "Communication guide for IMI projects" for further information. In case of doubt or for further assistance, please contact WP10 leader (kathryn.forrest@ersnet.org)

4.2 Dissemination of Results, including Publication Policy

A partner who wishes to disseminate any results must circulate the proposed dissemination to the other beneficiaries by written notice at least sixty (60) days prior (Section 7.5.2 of the Consortium Agreement). This is to ensure – among other - that all partners are aware of the publications submitted as part of the DRAGON project, and to ensure no sensitive information is released. If no objection is received by the timeline the partner is free to proceed with the publication of the manuscript. A fast-track publication process can be requested with an explanation for the urgency (more details in the Consortium agreement Article 7.5.2.4).

As agreed upon in the Grant Agreement and in line with H2020 rules, all publications related to the project must be fully open access (Gold Open Access or Green Open Access with 6-month embargo). All peer-reviewed scientific publications must be deposited as a machine-readable electronic copy of the published version, as soon as possible, but at the latest on publication. As mentioned in the previous section, DRAGON funding needs to be acknowledged at all times.

Details of any publication and an electronic copy of the published version must be provided to the IMI2 JU within 2 months following publication.

A Publications Policy will be developed as part of Deliverable 10.4 and this will provide further clarification and guidance.

4.3 Website and Social Media Platforms

The project website is our main communication channel and connection to the public as well as other researchers. It will also be a central platform for potential collaborators, clinicians, patients, and the general public. The temporary DRAGON website will be available in mid-December 2020 via the ELF website (https://www.europeanlung.org/en/projects-and-research/projects/dragon/dragon/). A more expanded website is expected during the spring 2021 when the new ELF website will be launched.

Apart from the website, updates on the DRAGON project will be shared on social media. DRAGON consortium members are encouraged to further disseminate official posts on Partner social media platforms.

4.4 DRAGON Logo and visuals

The DRAGON logo was designed by ERS and was selected in a survey sent out to all partners. Using the selected logo, ERS has prepared a PowerPoint template, letterhead and banner to be used DRAGON related activities where appropriate. These documents can be found in the General channel of the IMI_Dragon Team, “Dissemination and Communications” folder, “DRAGON Logo and Visuals” folder