Domain	Abbreviation	National Facilities and/or Priorities	Centres of Excellence
Electron Microscopy	EM	1. High-Resolution TEM for Structural Biology using CryoEM and electron tomography. Based at Diamond. (Affiliated w/ INSTRUCT). Proposal submitted and under review(Wellcome). 2. Volume SEM – automated physical sectioning and imaging within the SEM chamber over hundreds of microns at nanometer resolution. Focused Ion Beam SEM (FIB/SEM) and Serial Block Face SEM (SBF/SEM or 3View).	1. Correlative Light and Electron Microscopy (CLEM) - distributed network across the UK, providing expertise, training, and access. These types of centre need to be associated with both down- and up-stream technologies (e.g. different types of light microscopy, culture facilities, and sample preparation methods). 2. Cellular Electron Tomography - Room temperature Electron Tomography is a very valuable research technique that not always requires the highest resolution instruments but does need dedicated staff, especially for the data analysis. 3. Analysis Electron Microscopy – Increasingly, the techniques of what traditionally were considered material science EM are also being applied to biomedical questions. Technologies such as EDX, STEM, SIMS, GIF, and EELS have already shown their use but they are not applied widely, mainly because of the unfamiliarity with the technology. 4. Cryo FEG SEM – High resolution biological SEM is best performed on samples that are in their native state, i.e. frozen rather than chemically fixed. There are only a limited number of such systems available in the UK because handling and imaging these samples is not easy. Opening such instruments to the wider community as Centres of Excellence will create completely new opportunities for research
Light Microscopy	LM	High-throughput/High-content screening - automated systems for imaging large arrays of perturbations, typically small molecule or genome-wide siRNA libraries. This requires large scale capabilities in labelling (e.g. reverse transfection), sample management (robotics), instrumentation (plate readers & ancilliary equipment), data analysis and management	1. Super-resolution fluorescence microscopy - SIM; STED/RESOLFT; stochastically switched single molecule localization techniques 2. FLIM & other spectrscopic readouts - especially in living cells, with probes expresed at endogenous levels 3. FCS & other correlation readouts - for measuring/mapping the component and absolute concentration of
Pre-Clinical/ Model Systems	PC	Change in Home Office policy: allow remote placement/access for animal models	Multi-modal imaging facilities-- combinations of PET, SPECT, CT, MR, ultra-sound, luminescence, whole-body and high resolution fluorescence, and emerging technologies such as opto-accoustic imaging. These must be integrated with appropriate animal housing/handling/preparation facilities.
Medical Imaging	MI	1. 7T, 9.4T whole body MRI facilities 2. PET + cyclotron + radio chemistry/ligands 3. An "open" MRI scanner – where all pulse sequences etc are open – needs standardisation of hardware (difficult?!), but would change completely the business model for research MRI (and other scanner) facilities.	Specialised "nodes" each innovating in a specific area, and each acquiring a critical mass of science/engineering/ICT/life sciences expertise and range of researchers. Specific nodes likely focussed on 1. MRI 2. PET 3. SPECT 4. optical/fluorescence.
Probes	Ps	1. National Probe development and distribution centre: combining expertise on synthesis and application, ensuring best practice, reuse of know-how, consistency. 2. Central on-line database of probes and biomarkers . A central resource for expert advice and a conduit for transfer of information. The Centre would unite platforms and communities (both medical and non-medical), and remove duplication of effort in certain areas of probe design. It would ensure no redundancy of probes and result in maximum exposure of a new ligand/probe, across modalities and scales.	Specialised BioProbe 'nodes' that specialise/innovate in a specific areas and individual modalities, keeping their own records and expertise, and feed into the central resource.
Software/ Data	S/D	Software & Data can be presented as a National Facility, which is in fact "virtual", made up of several distributed, collaborating facilities. However, the presence of a single resource favors easy access by the researcher and adds authority. 1. Central BioImage Software Registry of open software tools for image acquisition, management, and analysis, protocols (esp. for medical imaging), 2. Validation Sets for BioImage Processing and Analysis-- reference datasets for distribution for testing and validating analysis tools. 3. Data and Tool hosting-- resources for serving and hosting software, published data, and registries of resources.	Software Development Centres-- tools for multi-dimensional microscopy, multi-modal clinical imaging. 1. Image Data processing and analysis software 2. Image Data management, sharing and publishing software
Training	Tr		**Doctoral Training Centres:** 1. Development and application of probes across biological and medical imaging applications 2. Biophotonics applications 3. Multi-modal imaging, especially combining methods for LM, EM, MR, CT, PET for PC imaging. 4. BioImage processing and analysis; software deveopment process and methods for the biological sciences 5. Radiochemistry

Table 1. Strategic Resources for BioImagingUK.
Imaging technologies and priorities defined by the BioImagingUK Strategy Meeting Breakout Groups as important to provide as a rescource for all UK scientists, either via a single National Facility or in distributed Centres of Excellence