



CINTESIS

CENTER FOR HEALTH TECHNOLOGY
AND SERVICES RESEARCH





Additional information for the evaluation panel

1. Introduction and methods

Following several questions raised during the site visit on June 22, we wish to provide the four members of our evaluation panel (i.e. Charles Auffray, Martin Röllinghoff, Narender Ramnani and Shlomo Sasson) with some additional information regarding the amount and sources of funding of CINTESIS previously to our proposal for a new research unit submitted on December 2013 (i.e. between 2008 and 2013) together with some estimates for the first 6 years of the unit after the current evaluation (i.e. between 2015 and 2020).

For this analysis we included the total amount of funds received by the three FCT units who merged to constitute the new CINTESIS (i.e. old CINTESIS-ID753, UNIFAI-ID688 and CME-ID121) and estimated those received by the Microbiology group from UIDCV-ID51 and by the group of researchers from a miscellaneous of other units.

For the period between 2008 and 2013, the analysis presented below is based on the pluri-annual FCT funding (i.e. the real annual transfers of money from FCT to the units to provide for their running expenses). For the period 2015 to 2020, the analysis estimates an annual FCT funding based on a conservative scenario of a Very Good classification for CINTESIS and on the approval of our proposed strategic plan (i.e. as requested in our proposal).

The amount related to the salaries of CINTESIS's researchers were calculated on the basis of an average annual gross income, including employer charges, of approximately 62.000 Euros (paid normally by an higher education institution such as a university or an healthcare institution such as an hospital) multiplied by 0.3, assuming that each CINTESIS member dedicates, on average, 30% of his working time to research.

2. Past and future funding

Table 1 show the amount and sources of funding of CINTESIS for the period 2008 to 2020. Three main types of funding sources were considered: (1) **direct baseline funding** i.e. those directly related to FCT annual (a) basic and (b) strategic funding, which represent the main contribution of our national scientific system for the running expenses of the units and depend mostly on the grading of the unit (e.g. very good or excellent); (2) **direct project funding** i.e. those directly related to scientific projects funded by (a) FCT or by (b) the European Commission, and (c) technology transfer or industrial projects and personal scientific grants, which depend mostly on the capacity of the unit to attract research funds; (3) **indirect sources of funding** i.e. those arising from (a) master and PhD courses tuition fees and (b) a proportion of the salaries of CINTESIS members, which depend mostly on the non-research activities (e.g. related to teaching and professional activities in the healthcare industry) of CINTESIS researchers, who are mostly employed by Portuguese universities and healthcare institutions (e.g. hospitals).

The reason to distinguish between these three types of funding sources is that only the first type is directly managed by the coordinator and the executive committee of CINTESIS. The second type is mainly managed by the main and associated host institutions for CINTESIS





researchers and its activities. Finally, the third type only indirectly relates to CINTESIS as both the tuition fees and the non-full time researcher's salaries are managed by their own employers e.g. the teaching and/or healthcare institutions where the majority of CINTESIS researchers work.

By 2020, table 1 also shows that the proportion of FCT pluri-annual (basic plus strategic) funding is expected to remain quite low (less than 10%) and it should not significantly differ from the one in 2008 (8% vs. 7%, respectively). This shows that CINTESIS is not expecting to depend mainly from public FCT funds. Instead, it will use these organizational baseline funds to attract new sources of funding such as EU and industrial funded projects.

What it expected to be considerably different by 2020 – in comparison with 2008 and 2013 – is the rising proportions of funding derived from direct project funding (9% in 2008, 26% in 2013 and 29% in 2020) contrasting with the significant downfall of the proportions of funding originated from indirect sources of funding i.e. derived from the non-research activities of CINTESIS researchers (84% in 2008, 70% in 2013 and 63% in 2020). This downfall is very interesting and quite desirable as it indicates the rise of the importance of true research funding sources in paying for CINTESIS activities.

In fact, for the first years of our activities and even today on a very significant proportion, CINTESIS relies too much on university and hospital indirect funding, which does NOT allow to engage fully dedicated members of staff for our unit making it therefore very difficult to organize an adequate administrative / scientific structure. This is why the pluri-annual FCT funding (basic and/or strategic) is so important for the unit daily activities and its normal governance. Without it CINTESIS cannot afford to engage any member of staff.

From figure 1, it can be noticed that the total amount of funding has been continuously rising (2.247 KEuros in 2008, 3.673 KEuros in 2013 and 6.590 KEuros in 2020), derived from the increasing number of integrated researchers but, most significantly, from an increasing ability to raise and attract type 2 funding (i.e. direct project funding) from a number of different sources.



Table 1: CINTESIS real (in black) and estimated (in blue) financial resources, between 2008 and 2020, according to type of funding source. The values from 2014 to 2020 were calculated, based on the proposed funding for the unit, assuming a grading scenario of "very good" and a conservative estimate of 5% rate of growth in all sources of funding.

Funding	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020	
	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%	K Euros	%
1. Direct baseline funding																										
a) Basic FCT funding	154	7	231		251	8	174	6	178	6	144	4	128	3	200	4	200	4	200	3	200	3	200	3	200	3
b) Strategic FCT funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	314	7	323	6	331	6	324	5	315	5	332	5
Subtotal	154	7	231	9	251	8	174	6	178	6	144	4	128	3	514	11	523	10	531	9	524	9	515	8	532	8
2. Direct project funding																										
a) FCT funded projects	48	2	77	3	173	6	133	4	171	6	310	8	202	5	198	4	208	4	218	4	229	4	240	4	252	4
b) EU funded projects	0	0	0	0	0	0	0	0	23	1	224	6	201	5	201	4	801	15	1 001	17	1 201	20	1 201	19	1 201	18
c) Other funded projects (e.g. industry)	161	7	203	8	328	11	442	15	374	13	424	12	305	8	375	8	393	7	413	7	434	7	455	7	478	7
Subtotal	209	9	280	11	501	16	575	19	568	19	958	26	708	18	773	17	1 402	26	1 632	28	1 864	30	1 897	30	1 931	29
3. Indirect sources of funding																										
a) MSc and PhD tuition fees	424	19	426	17	425	14	424	14	428	15	420	11	412	11	433	10	454	9	477	8	501	8	526	8	552	8
b) Researcher's salaries	1 459	65	1 555	62	1 926	62	1 859	61	1 775	60	2 152	59	2 667	68	2 801	62	2 941	55	3 088	54	3 242	53	3 404	54	3 574	54
Subtotal	1 883	84	1 981	80	2 351	76	2 283	75	2 203	75	2 571	70	3 079	79	3 233	72	3 395	64	3 565	62	3 743	61	3 930	62	4 126	63
Total	2 247	100	2 491	100	3 102	100	3 031	100	2 949	100	3 673	100	3 915	100	4 520	100	5 320	100	5 728	100	6 130	100	6 341	100	6 590	100
Number of PhD integrated researchers, according to FCT rules	85		88		95		99		110		100		127		133		140		147		154		162		170	

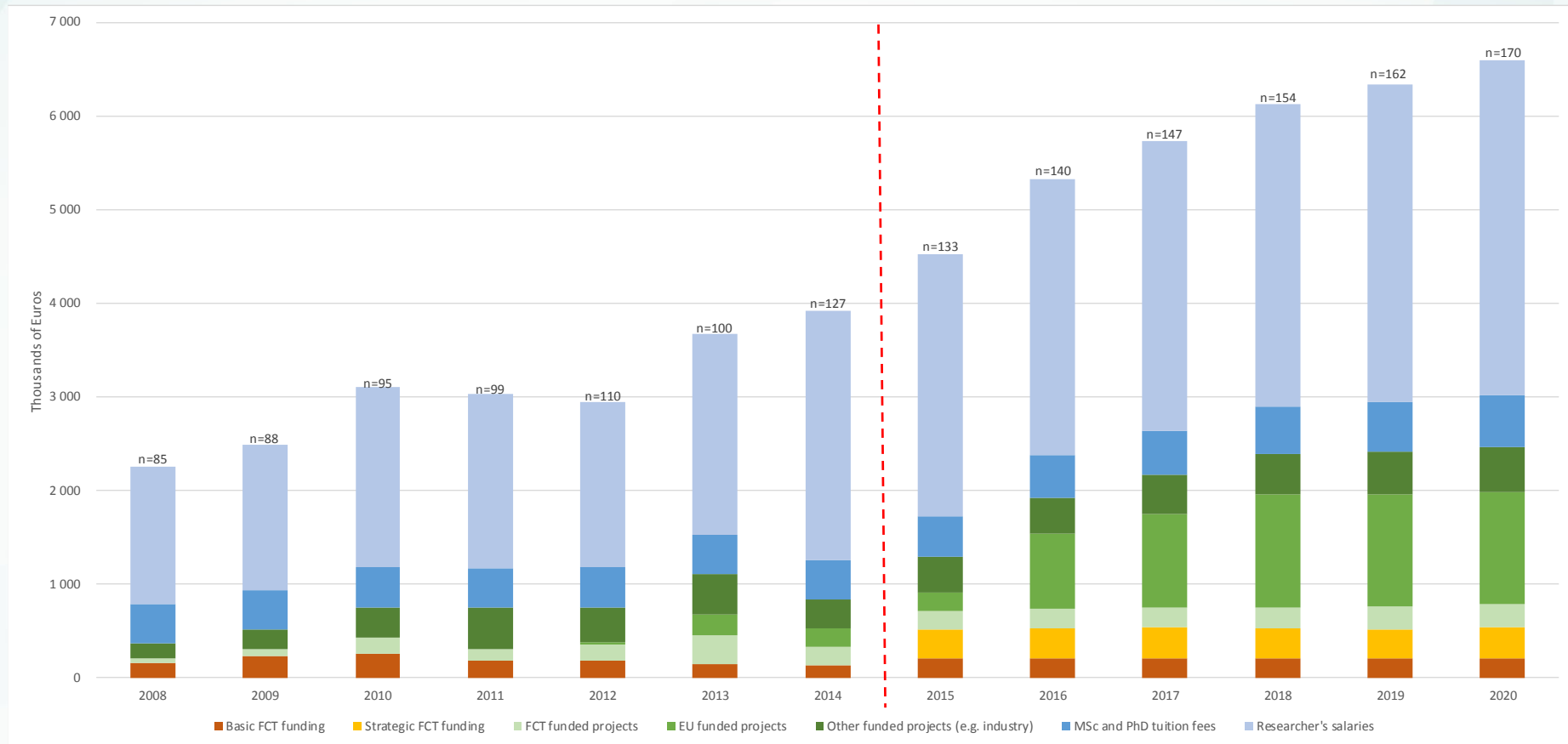


Figure 1: CINTESIS real (left) and estimated (right) funding sources, between 2008 and 2020, with number (n=) of integrated researchers per year, assuming a grading scenario of "very good" and the strategic plan approved.



3. Cost and performance indicators

Having in mind the amount of resources available between 2008 and 2013 and those estimated for the period between 2015 and 2020, described above, we would also like to include some data on the most important scientific outcomes already achieved or expected to be achieved in the future. In fact, we believe that it is always important to have an indication on the costs involved in producing scientific products such as indexed publications, external citations and/or new PhDs (i.e. the cost-effectiveness of a particular research unit).

In this context, table 2 shows the main scientific outputs in the period before our proposal for a new unit (i.e. from 2008 to 2013) and those extracted from our proposal and expected for the first six year of the new unit (i.e. from 2015 to 2020).

As indicators of scientific performance (and associated cost-effectiveness) for the entire unit (as well as for each of its thematic lines and research groups), we propose the calculation of the yearly average cost, considering (a) the total amount of FCT annual basic and strategic funding and/or (b) the total amount of resources available annually) of: (i) number of ISI / Scopus indexed publications; (ii) number of ISI / Scopus citations; (iii) number of concluded PhDs.

For example, it can be estimated that for a conservative scenario funding corresponding to approximately only **half a million Euros per year**, CINTESIS will produce an estimated annual number of around **250 Scopus indexed publications, 1,300 citations and 23 concluded PhDs**, which makes the FCT (basic and strategic) funding on CINTESIS an excellent “value for money” investment, as each new indexed publication will be “costing” to FCT less than 3,000 Euros (in fact only 2,000 Euros, in average, by 2020) besides inducing (freely) more than 1,000 new external citations and supporting the scientific education and training of more than 20 new PhDs per year.





Table 2: CINTESIS real (in black) and estimated (in blue) scientific outcomes, between 2008 and 2020. The values with respect to the number of SCOPUS indexed publications and the number of PHD thesis concluded, from 2014 to 2020, were estimated according to our proposal, submitted to FCT by December 2013.

Outcomes	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
SCOPUS indexed publications	133	127	137	172	155	198	75 *	200	210	221	232	243	255
SCOPUS citations	1 594	1 647	1 706	1 032	621	1 320							
Concluded PhDs	75							20	21	22	23	24	26

* Up to June 2014



4. Final remarks

We would like to stress that we are fully aware of the relatively small amount of the requested strategic funding (i.e. approximately 320,000 Euros per year), specially considering the size of our new unit (over 100 integrated researchers) and the expected difficulties with applying for other very competitive sources of funding such as the EU funding. In addition, the proposed decentralized network model can also be quite challenging with respect to its governance. This is particularly relevant considering that we expect to increase the size and the quality of our research, which will be especially difficult in those groups who have currently relatively low scientific outputs.

However, we are also aware of the particularly difficult economic situation in our country that is struggling to keep the current level of development of our national scientific system. That is why we chose to reduce to a minimum our funding request (namely with respect to the strategic funding), in order to contribute, in a responsible manner, to the economic challenges faced by our society.

Nevertheless, we also expect that these efforts will be shared by all the other Portuguese units and we believe that FCT should, in the future, evaluate (or at least try to measure) the amount of scientific, economic and social outcomes achieved by the FCT funded research units considering the total funds provided to them.

In these instances, annual indicators such as the number of ISI / Scopus indexed publications, the number of citations, the number of concluded PhDs, and/or the revenue from patents should be considered in relation to the total amount of funding received from FCT by a particular research unit. If successfully implemented, this new evaluation system would certainly allow easier and fairer comparisons among research units (at least among those investigating within similar scientific areas) and help to increase the cost-effectiveness of the entire national scientific system, by providing (hopefully) incentives to those who do more for less.

We would like to thank the panel for the questions raised, which prompted us to make the above estimation exercise, allowing for a better understanding of our own financial and organizational challenges.

Finally, it should be noticed that most of the above presented funding is not directly managed by CINTESIS. In fact, the indirect funding derived by the salaries of the majority of our researchers together with the direct funding derived by funded research projects are managed mostly by the high education institutions that employ the researchers / the project principal investigator. Nevertheless, it is crucial to ensure the future development of CINTESIS that an adequate basic and strategic funding is provided by FCT allowing the unit coordinator (together with the executive committee of CINTESIS) to help all our researchers (regardless were they are located) to improve the level of their research outputs and their capacities to attract other sources of funding. In fact, we firmly believe that only by strengthening our organizational capability it will be possible to increase the number and quality of our activities.



Porto, 4th August 2014

Altamiro da Costa Pereira

Coordinator

