

# International collaborations

The research labs of the target university have naturally established a dense network of international scientific cooperations.

As measured by the numbers of joint publications in the Web of Science during the period 2012-2016, their first partners are in Europe (map 1: Germany, UK, Italy and Spain being the first countries) and in North America (map 2).

In addition to these existing collaborations, the target university will build upon the privileged partnerships established by USPC over recent years, upon the existing international associated labs created by CNRS, Inserm and IRD, and involving Paris Descartes and Paris Diderot teams, and upon the broad network of observatories managed by IPGP and (map 3).



**Map 1. Main North American partners of the target university, by number of publications**  
**Source: Web of Science 2012-2016**

The map above shows our main partners in North America in terms of number of co-authored publications, according to the Web of Science 2012-2016.

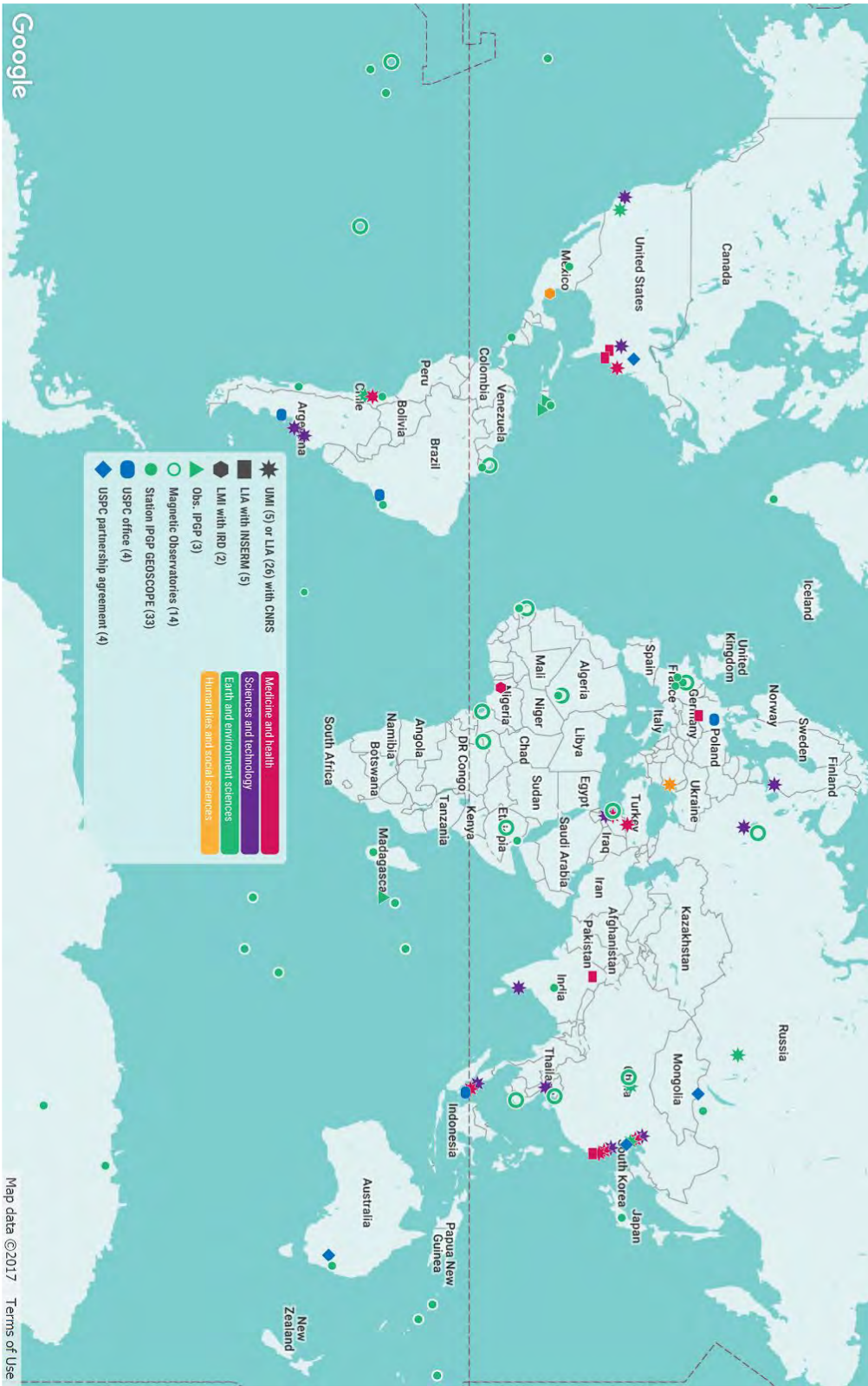
Between 1000 and 1600 publications	Between 900 and 1000 publications
<ol style="list-style-type: none"> <li>1. Harvard University</li> <li>2. University of Toronto</li> <li>3. Stanford University</li> <li>4. McGill University</li> <li>5. University of California Berkeley</li> <li>6. Massachusetts Institute of Technology</li> </ol>	<ol style="list-style-type: none"> <li>7. University of Montreal</li> <li>8. Columbia University</li> <li>9. University of Chicago</li> <li>10. University of British Columbia</li> <li>11. University of Michigan</li> <li>12. University of Washington</li> <li>13. University of Washington Seattle</li> </ol>



**Map 2. Main European partners of the target university, by number of publications**  
**Source: Web of Science 2012-2016**

The map above shows our main partners in Europe in terms of number of co-authored publications, according to the Web of Science 2012-2016.

More than 1500 publications	Between 1000 and 1500 publications	Less than 1000 publications
1. Max Planck society 2. Consejo Superior de Investigaciones Científicas 3. University of Oxford 4. University of Cambridge 5. University of Manchester 6. Ruprecht Karl University Heidelberg	7. Sapienza University Rome 8. Russian Academy of Sciences 9. University College London 10. University of Edinburgh 11. Imperial College London 12. University of Geneva 13. Radboud University Nijmegen 14. University of Rome Tor Vergata 15. University of Milan 16. University of Birmingham 17. Lomonosov Moscow State University	18. University of Liverpool 19. University of Bologna 20. University of Glasgow 21. University of Copenhagen 22. University of Pisa 23. University of Munich 24. Humboldt University



Map 3. USPC offices, laboratories and infrastructures

# Rankings

The scientific profiling of the Target University as proposed in the previous section is connected with a key issue concerning its future visibility as a world-class university, namely academic rankings.

The ARWU simulations presented in this annex have been prepared by Pr. Domingo Docampo, University of Vigo, specialist of academic rankings and author of many specialized studies on this topic.

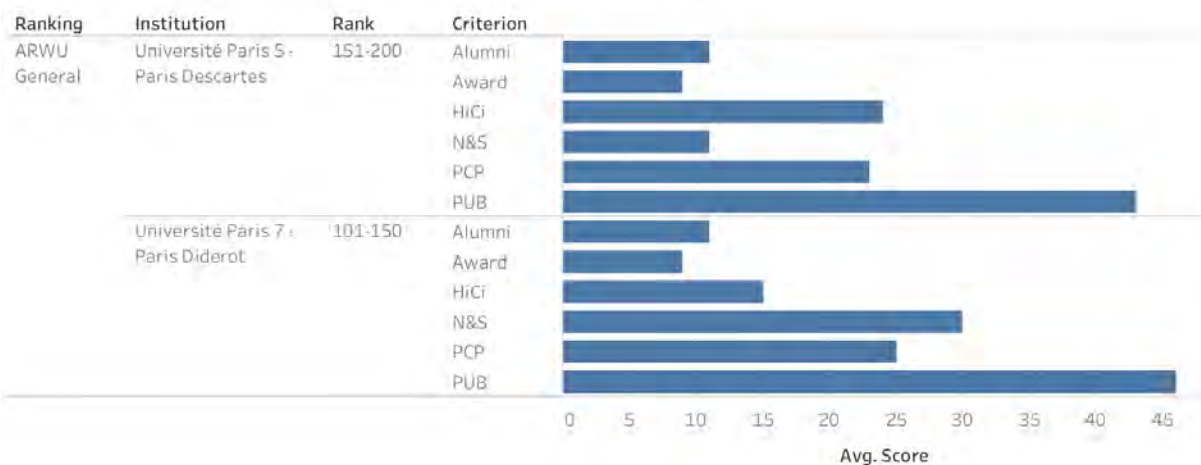
## Simulations

### General rankings

We produced analyses and simulations showing that the merging of Paris Descartes (specialised in Medicine), Paris Diderot (comprehensive) and IPGP (strong in Earth Science) creates an original complex that will result in a spectacular increase in their overall ranking.

In ARWU, Université Paris 5 is currently ranked 151-200, and Université Paris 7 101-150:

#### General Rankings - ARWU



In THE, Université Paris 7 is ranked 201-250:

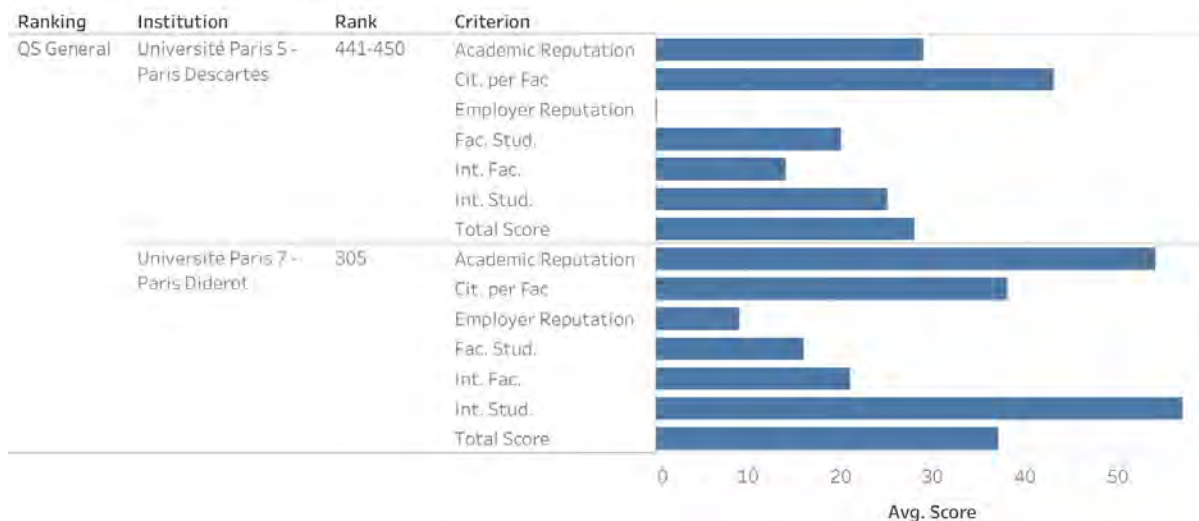
#### General Rankings - THE





And in QS, Université Paris 5 is ranked 441-450, Université Paris 7 305:

### General Rankings - QS



Our prospective analyses show that the target university would significantly improve these results. In particular, it would reach the top 60 of ARWU (rank 53):

ARWU	Perimeter	ALU	AWD	HICI	N&S	PUB	PCP	Score	FTE
101-150	Paris Diderot	11.4	9.3	15.4	29.5	46.2	24.5	24.2	1329
151-200	Paris Descartes	11.4	9.3	24.4	11.1	42.5	22.8	21.3	1211
53	USPC as a whole	16.1	13.1	28.9	32.1	67.2	19.2	32.5	4,260
53	Target University	16.1	13.2	28.9	32.1	63.1	23.5	32.1	2,624

If we compare the projected performance of USPC as a whole and of the Target University within this projection, we see that the the volume of publications is rather close (the difference between the number is proportionally much smaller than the quantitative difference of perimeter - 4.260 vs 2.624 FTE), but that the density is higher within the Target University: Alumni, Awards and HiCi are equal, which shows that the Target University is the place where excellent research is concentrated; Pro capita performance (PCP) is higher within the Target University than within USPC as a whole.

### Thematic rankings

The analysis of the position of the Target University in thematic rankings can be read in echo to scientific-bibliometric profiling presented above, that was showing that important fields of specialization were :

- Health Sciences
- Life Sciences, especially Immunology and Microbiology, Neuroscience and Biochemistry

- Multidisciplinary
- Psychology
- Natural Sciences with Earth and Planetary Sciences and Physics

One may confront these areas of strength with a simulation of the projected performance of the Target University within ARWU's ranking by subject.

This rankings rests upon the following set of indicators :

- PUB, number of papers authored by an institution
- CNCI, category-normalized citation impacts from InCites
- IC, percentage of internationally collaborated papers
- TOP, number of papers in top academic journal (by subject)
- AWARD, number of staff of institution winning an award in the subject

The respective weight of these indicators varies for each discipline<sup>5</sup>.

On the basis of our simulations, our target university would access the top 50 in the World in 8 of ARWU's subject rankings, and significant positions in an important number of them:

- **Formal sciences:** Top 25 (rank 24) in Mathematics and Top 30 (rank 26) in Physics;
- **Earth sciences:** Top 25 (rank 17);
- **Life sciences:** Top 30 in Human Biology (rank 29); Top 50 in Biology (rank 49);
- **Medicine:** Top 50 in Clinical Medicine (rank 33), Pharmacy (rank 30), Medical Technology (rank 41) and Top 75 in Dentistry (rank 59);
- **Material sciences:** Top 150 (rank 133);
- **Chemistry:** Top 200 (rank 159);
- **Nanoscience and nanotechnology:** Top 150 (rank 143).

ARWU subject	Indicators						Rank
<b>MATHEMATICS</b>	PUB	CNCI	IC	TOP	AWD	TOTAL	
Paris 5	15,3	68,5	68,5	0	0	97,5	>500
Paris 7	66,5	64,3	71,9	58,8	0	204	25
Target University	68,2	64,5	71,8	58,8	0	205,9	24
<b>PHYSICS</b>	PUB	CNCI	IC	TOP	AWD	TOTAL	
Paris 5	23,5	48,9	72,8	20,6	0	107,6	>500
Paris 7	73,5	57,3	90	69	0	217,7	27
Target University	76,6	56,2	88,2	70,1	0	220,5	26
<b>EARTH SCIENCES</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	30	58,1	79,5	11,7	0	115,7	>300
Paris 7	58,7	71,6	88,9	64	28,9	240,9	27
Target University	79,3	68,5	89,5	77,6	28,9	272,2	17
<b>BIOLOGY</b>	PUB	CNCI	IC	TOP	AWD	TOTAL	

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<http://www.shanghairanking.com/Shanghairanking-Subject-Rankings/Methodology-for-ShanghaiRanking-Global-Ranking-of-Academic-Subjects-2017.html>

Paris 7	38,3	46,8	74,2	24,2	0	124,1	101-150
Paris 5	42,2	48,3	76,7	27,2	0	133	76-100
Target University	54,9	47,2	76,2	35,3	0	152,6	49
<b>HUMAN BIOLOGY</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 7	30,9	71,1	70,6	28,6		144,7	101-150
Paris 5	41,9	73,7	74,6	38,7		169	47
Target University	50,3	71,4	73,5	48,4		184,8	29
<b>DENTISTRY</b>	PUB	CNCI	IC	TOP	AWD	TOTAL	
Paris 7	19,4	78,6	80,3	27,2	0	141,4	101-150
Paris 5	25,3	66,7	75	40,8	27,4	174,4	76-100
Target University	30,2	71,3	77,3	45,1	27,4	189,5	51-75 (59)
<b>CLINICAL MEDICINE</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	39	72	69,1	28,6	0	153,3	76-100
Paris 7	31,6	79	67,1	34	0	158,1	51-75
Target University	50,1	73,6	68,4	42,8	0	180,2	33
<b>PHARMACY &amp; PHARMACEUTICAL SCIENCES</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	39	72	69,1	28,6	0	153,3	76-100
Paris 7	31,6	79	67,1	34	0	158,1	51-75
Target University	50	74,5	68,5	44	0	182,2	30
<b>MEDICAL TECHNOLOGY</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	27,1	82,4	59,9	27,4		148,9	76-100
Paris 7	27,9	82,1	64,6	31,2		154,2	76-100
<b>USPC</b>	38,3	82,2	62,1	41,1		174	41
<b>MATERIALS SCIENCE</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	23,2	65	73,8	24,3	0	127,3	201-300
Paris 7	30,1	62	74,6	24,3	0	131,3	201-300
Target University	36,9	62,7	74,7	34,3	0	148,8	101-150 (133)
<b>CHEMISTRY</b>	PUB	CNCI	IC	TOP		TOTAL	
Paris 5	35,1	59,9	68,5	22	0	130,7	301-400
Paris 7	35,6	67,2	76,1	25,8	0	143,8	201-300
Target University	49,5	63,1	72,8	33,6	0	160,8	151-200(159)
<b>NANOSCIENCE &amp; NANOTECHNOLOGY</b>	PUB	CNCI	IC	TOP		TOTAL	

Paris 5	21,4	65	73,1	22	0	123	>300
Paris 7	33,4	61,5	74,1	30,4	0	140,1	201-300
Target University	39,7	62,1	73,9	37,5	0	153,7	101-151 (143)



## Volume and impact of research

In addition to the global simulation we just presented, it is interesting to examine an equivalent of the alternative ranking of ARWU<sup>6</sup>, which does not take into account past performance as measured by Alumni and Award criteria, and is therefore adapted to assess the strengths and weaknesses of an institution in terms of real-time research and research impact.

Now, on the basis of a simulation of such an alternative ARWU ranking, we see that our Target University would be ranked 43<sup>rd</sup> in the World, thus being the leading French University (the perimeter taken into account here being that of the Target University):

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<sup>6</sup> This simulation has been performed on the model of ARWU's 2015 Alternative ranking, that excludes the Award factor.











[http://www.shanghairanking.com/Alternative\\_Ranking\\_Excluding\\_Award\\_Factor/Excluding\\_Award\\_Factor2015.html](http://www.shanghairanking.com/Alternative_Ranking_Excluding_Award_Factor/Excluding_Award_Factor2015.html).

rank arwu	rank nn	Institution*	Hici	S&N	PUB	PCP	SCORE	FTE		
1	1	Harvard University	100	100	100	88,17	100	1674	17,921147	98,3096861
2	2	Stanford University	87,3	74,4	73,7	63,53	77,64	1998	9,30347347	76,3322475
5	3	University of California, Berkeley	63,6	68,1	66,7	62,53	66,75	1457	9,01266987	65,6178602
4	4	Massachusetts Institute of Technology (MIT)	56,7	72,4	63,5	73,09	66,6	1014	12,3164694	65,4702951
7	5	University of Oxford	62,7	52,5	75,8	55,37	63,56	1759	7,06832291	62,481625
3	6	University of Cambridge	54,6	57,3	69,8	55,19	60,83	1586	7,02174653	59,7983772
15	7	University of California, San Diego	58,8	56,4	63,7	48,89	59,1	1941	5,51060793	58,0986814
13	8	University of Washington	56,7	51,2	74,3	41,55	58,99	2853	3,98065896	57,9933161
12	9	University of California, Los Angeles	63,6	44,9	70,9	41,1	58,11	2847	3,89454865	57,1287589
8	10	Columbia University	50	53,8	70,3	36,82	55,95	3307	3,12565165	55,0030221
25	11	University of Michigan-Ann Arbor	54,6	40,7	77,9	34,39	55,33	3926	2,72696383	54,3989632
9	12	California Institute of Technology	39,3	56	44	100	55,02	287	23,0539721	54,0857143
11	13	Yale University	48,8	57,1	61	42,98	54,75	2199	4,25777626	53,8250375
16	14	University College London	47,6	39,6	77	42,05	53,83	2395	4,07637578	52,921404
23	15	University of Toronto	40,8	39,6	80,6	42,02	52,9	2390	4,07077824	52,0029925
20	16	Washington University in St. Louis	60,7	43,3	52	51,7	52,85	1341	6,16210291	51,9571607
17	17	University of Pennsylvania	50	38,7	68	49,26	52,7	1541	5,59486697	51,8090186
26	18	Duke University	61,7	37,8	61,5	35,08	51,89	3179	2,83673482	51,0111621
18	19	Johns Hopkins University	40,8	42,8	73,3	37,15	51	2787	3,18240761	50,1362789
22	20	Northwestern University	59,8	34,1	59,3	44,3	50,96	1825	4,52347397	50,099409
14	21	Cornell University	43,6	46,1	61,1	48,38	50,86	1438	5,39595271	49,9970684
21	22	University of California, San Francisco	39,3	50,8	61,4	41,35	50,04	2003	3,94163255	49,1927167
19	23	Swiss Federal Institute of Technology Zurich	36,2	49,5	56,9	57,88	49,85	906	7,72439294	49,0120145
6	24	Princeton University	47,6	46,6	43,3	60,18	48,71	756	8,34948413	47,8829513
30	25	University of Copenhagen	34,5	36,6	66,7	56,27	48,23	956	7,2998954	47,4101577
31	26	University of British Columbia	47,6	31,2	65,6	37,44	47,41	2334	3,2316024	46,6057172
24	27	The University of Tokyo	28,9	45,2	70,3	36,98	47,34	2480	3,1533629	46,540574
27	28	Imperial College London	42,3	30,9	64,8	49,07	47,24	1251	5,55007194	46,4379317
48	29	Tsinghua University	37,8	35,2	70,3	33,97	46,58	2860	2,66082867	45,7961616
39	30	The University of Melbourne	45	22,8	69,7	45,1	46,51	1579	4,68836605	45,7279978
33	31	University of North Carolina at Chapel Hill	42,3	31,8	61,5	45,8	46,06	1361	4,836723	45,2862755
55	32	The University of Queensland	40,8	25,6	64,8	47,13	44,98	1273	5,1210055	44,2186846
34	33	University of Minnesota, Twin Cities	39,3	33,1	65,2	31,21	44,53	3068	2,24613429	43,7733829
32	34	The University of Edinburgh	46,3	29,7	53,8	36,7	43,06	1907	3,10446775	42,3280238
71	35	Mayo Medical School	55,6	15,2	49,9	51,46	42,56	952	6,10547269	41,8374303
28	36	University of Wisconsin - Madison	34,5	33,4	63,5	29,54	42,48	3151	2,01144399	41,7625715
76	37	Swiss Federal Institute of Technology Lausanne	39,3	33	42,6	62,06	42,41	501	8,87874251	41,6941036
10	38	University of Chicago	36,2	41,1	50,3	36,12	42,33	1839	3,00692768	41,6164403
29	39	New York University	34,5	38,4	58,9	26,42	42,14	3813	1,6087123	41,4308507
78	40	Monash University	37,8	22,8	60,5	41,97	41,29	1381	4,06149891	40,5961467
42	41	Heidelberg University	34,5	28,8	53,6	47,14	40,82	955	5,12319372	40,1344087
51	42	The University of Texas at Austin	28,9	35,9	56,9	35,28	40,5	1869	2,86871589	39,8107591
		USPC	28,9	31,5	63,1	30,99	40,4	#####	2,21382241	39,712622

With a score of 63.1 on publications, the Target University would reach a performance that is comparable to (among others) the MIT (63.5), Yale (61), Cornell (61.1), and notably higher than many well-ranked institutions (Princeton, 43.3; Caltech, 44; EPFL, 42.6).

In addition, our Target University is currently the leading French institution according to ARWU's criteria of publications in Nature and Science.

Most importantly, the Target University is the leading French institution according to CWTS Leiden's ranking of PPTop10%, which measures citation impact:

	University		P	P(top 10%)	PP(top 10%)				
1	Univ Paris VII Paris Diderot		4502	621	13.8%				
2	Univ Paris V Paris Descartes		3537	480	13.6%				
3	Univ Paris XI Paris-Sud		5329	711	13.3%				
4	École Polytech		1497	200	13.3%				
5	Univ Paris VI Pierre & Marie Curie		7551	1005	13.3%				

## Reputation

An important factor that affects academic rankings such as THE and QS is academic reputation: it weighs for 40% of QS total score, and for 33% of THE total score.

An aspect to be taken into account in this respect is the existence of a so-called “halo effect”<sup>7</sup>: respondents to the reputation surveys sent by ranking agencies tend to quote the same bench of highly visible institutions, often on the basis of very global notions or prejudice, and without knowing local specialists in these institutions.

This effect is usually prejudicial to French institutions, that usually suffer from a branding deficit. Currently, the components of the Target University are affected by this deficit, as their research performance is very far from being reflected in their research performance.

One may in particular examine the case of University Paris-Diderot in THE, that receives the best scores on research impact (citations), but remarkably low scores on the research indicator (widely resting on reputation surveys)<sup>8</sup>:

<sup>7</sup> See in particular <http://leiterreports.typepad.com/blog/2011/06/guardian-and-qs-rankings-definitively-prove-the-existence-of-the-halo-effect.html>

<sup>8</sup> Data THE 2018. Visualization powered by SIRIS Academic.



Similarly, in QS, the most reputed French institutions are not those that receive the best scores on citations<sup>9</sup>:

<sup>9</sup> Data QS 2018. Visualization powered by SIRIS Academic.





The University of Paris will have a margin of action to act positively on this factor. A strong brand associated to an easily identifiable and recordable name (University of Paris), correlated with a prestigious territory will reinforce the capacity of survey respondents to quote it among institutions of excellence.