Pavia Citta della salute
24 Novembre 2018

IL PRODOTTO SCIENTIFICO

(Vittorio Bellotti)

Indice:

1.Dalla medicina di precisione alla medicina traslazionale

2.Caratteristiche di un prodotto scientifico di alta qualità

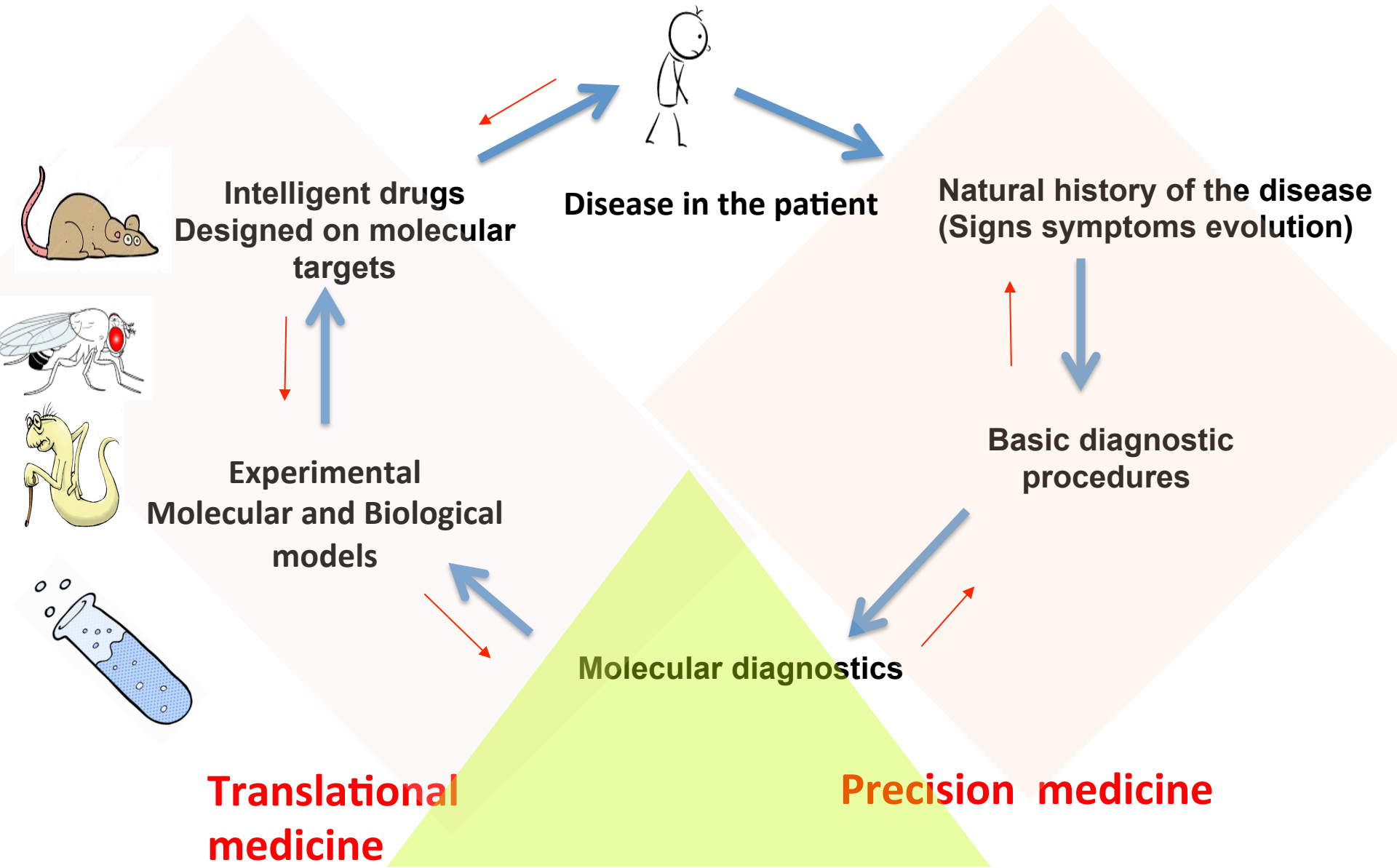
3.La valutazione, gli indici bibliometrici e I finanziamenti IRCCS

4. La valutazione della ricerca in Universita' (luci e ombre dell'ateneo di Pavia)

5. I modelli internazionali di valutazione

6. La forza coesiva dei "Casi d'impatto" utilizzati in UK

Dalla medicina di precisione alla medicina traslazionale



"What I cannot create I do not understand" by Richard Feynman

Caratteristiche di un prodotto scientifico di alta qualità

1. **Originale (***studio innovativo* ***o*** *confermativo?***)**
2. **Difendibile**
3. **Conosciuto internazionalmente**
4. **Identificabile la proprieta' intellettuale**
5. **……..**

Condizioni favorevoli (*necessarie?*)

Ambiente ad alta intensita' di cultura scientifica, continuita' negli investimenti tecnologici , liberta' di ricerca, reputazione, continuita' nelle procedure di reclutamento, cultura della successione per dare continuita' ai progetti

Supervisione indipendente e rigorosa , cultura organizzativa che si occupi della soddisfazione degli operatori, buona gestione degli insuccessi,

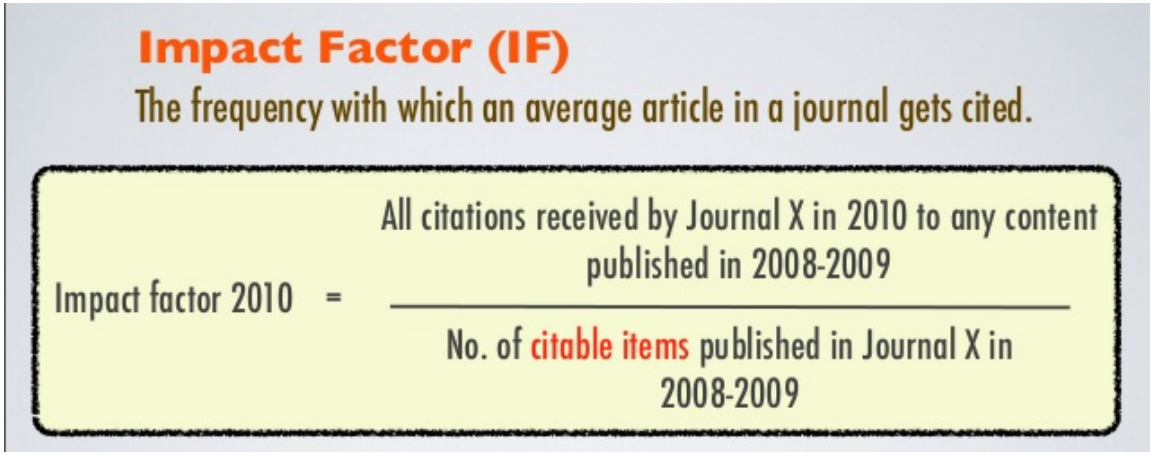
Se si lavora su un cluster di istituzioni eterogenee in termine di missione e struttura organizzativa devo esistere almeno obiettivi condivisi

Teoricamente un obiettivo condiviso del cluster delle istituzioni coinvolte nella ricerca e pratica biomedica dovrebbe essere il prodotto scientifico che dovrebbe avere simile impatto sul ritorno finanziario ed impatto economico.

Una forma condivisa di valutazione del prodotto scientifico

(Discrepanza tra Valutazione dei progetti e Valutazione delle persone e delle istituzioni)
(Discrepanza dei criteri di valutazione tra le varie istituzioni del cluster)

A. PRODUZIONE SCIENTIFICA (55%); **(IMPACT FACTOR CUMULATIVO)**
B. CAPACITA' DI ATTRARRE RISORSE (10%);
C. ATTIVITA' ASSISTENZIALE (20%);
D. CAPACITA' DI OPERARE IN RETE (10%);
E. TRASFERIMENTO TECNOLOGICO **(5%).**



Eugene Garfield :*I first mentioned the idea of an impact factor in Science in 1955. With support from the National Institutes of Health, the experimental Genetics Citation Index was published, and that led to the 1961 publication of the Science Citation Index. Irving H. Sher and I created the journal impact factor* ***to help select additional source journals****.*

TABELLA 1 - FFO 2018: Quadro assegnazione iniziale

	1	2	3	4	5	6=Somma (1-5)	7	8	9	10	11	12=Somma (6-11)
ATENEO	TOTALE QUOTA BASE	TOTALE QUOTA PREMIALE	TOTALE PEREQUATIVO	importo una tantum da attribuire o recuperare su quota base a valere su risorse rese disponibili sul perequativo per tetto max +3%	PIANI STRAORDINARI DOCENTI - ANNO 2018	**TOT FFO 2018 (base+premiale +perequativo+ piani straordinari)**	No TAX AREA (compensazione minor gettito contribuzione studentesca)[1]	QUOTA 2018 programmazione triennale 2016-2018	Accordi di programma (importo max attribuibile)	QUOTA 2018 dipartimenti eccellenza 2018-2022	Compensazione blocco scatti stipendiali	**FFO 2018**
Milano	172.820.315	79.623.769	2.438.921	33.952	11.285.086	**266.202.043**	1.306.280	1.220.844		11.370.665	1.953.450	**282.053.282**
Milano Bicocca	82.040.974	32.202.753	968.129	13.477	4.851.565	**120.076.898**	686.941	945.484		12.044.224	867.150	**134.620.697**
Milano Politecnico	134.707.023	48.395.942	1.482.395	20.636	8.901.151	**193.507.147**	2.319.003	1.589.412		7.464.024	1.262.900	**206.142.486**
Modena e Reggio Emilia	62.406.733	24.588.195	736.433	10.252	3.084.300	**90.825.913**	984.314	650.552		3.866.725	805.800	**97.133.304**
Molise	19.832.094	8.165.615	234.029	3.258	1.043.350	**29.278.346**	624.966	152.301		-	259.400	**30.315.013**
Napoli Federico II	226.266.133	88.175.727	5.839.663	81.293	10.680.705	**331.043.521**	6.975.876	2.345.434		8.541.718	2.417.250	**351.323.799**
Campania	86.100.663	30.263.755	4.477.618	62.332	3.658.948	**124.563.316**	2.412.446	734.944		1.077.693	903.150	**129.691.549**
Napoli L'Orientale	22.992.815	8.234.801	252.237	3.511	1.329.172	**32.812.536**	961.628	186.540		1.347.117	186.000	**35.493.821**
NAPOLI Parthenope	27.939.477	9.821.808	300.848	4.188	1.213.944	**39.280.265**	937.691	227.926		1.212.405	299.750	**41.958.037**
Padova	179.194.615	83.765.803	2.565.794	35.718	11.417.022	**276.978.952**	2.815.815	1.962.236		20.431.274	2.024.850	**304.213.127**
Palermo	131.384.378	45.516.713	5.667.306	78.894	5.740.720	**188.388.011**	4.882.412	1.234.977		1.616.540	1.491.000	**197.612.940**
Parma	77.053.995	27.155.484	4.309.562	59.993	4.711.673	**113.290.707**	1.721.327	905.125		1.866.006	882.150	**118.665.315**
Pavia	76.132.515	30.328.371	4.490.310	62.509	5.167.399	**116.181.104**	1.632.629	575.331		7.464.025	901.250	**126.754.339**
Perugia	82.607.940	34.047.980	3.078.704	42.858	3.733.383	**123.510.865**	2.027.476	609.203		6.002.154	1.037.600	**133.187.298**
Piemonte Orientale	33.372.949	13.291.342	-	-335.746	2.006.004	**48.334.549**	287.902	252.820		2.923.742	367.900	**52.166.913**
Pisa	125.874.992	52.453.683	1.485.394	20.678	7.461.927	**187.296.674**	2.564.488	1.408.174		3.482.546	1.434.050	**196.185.932**

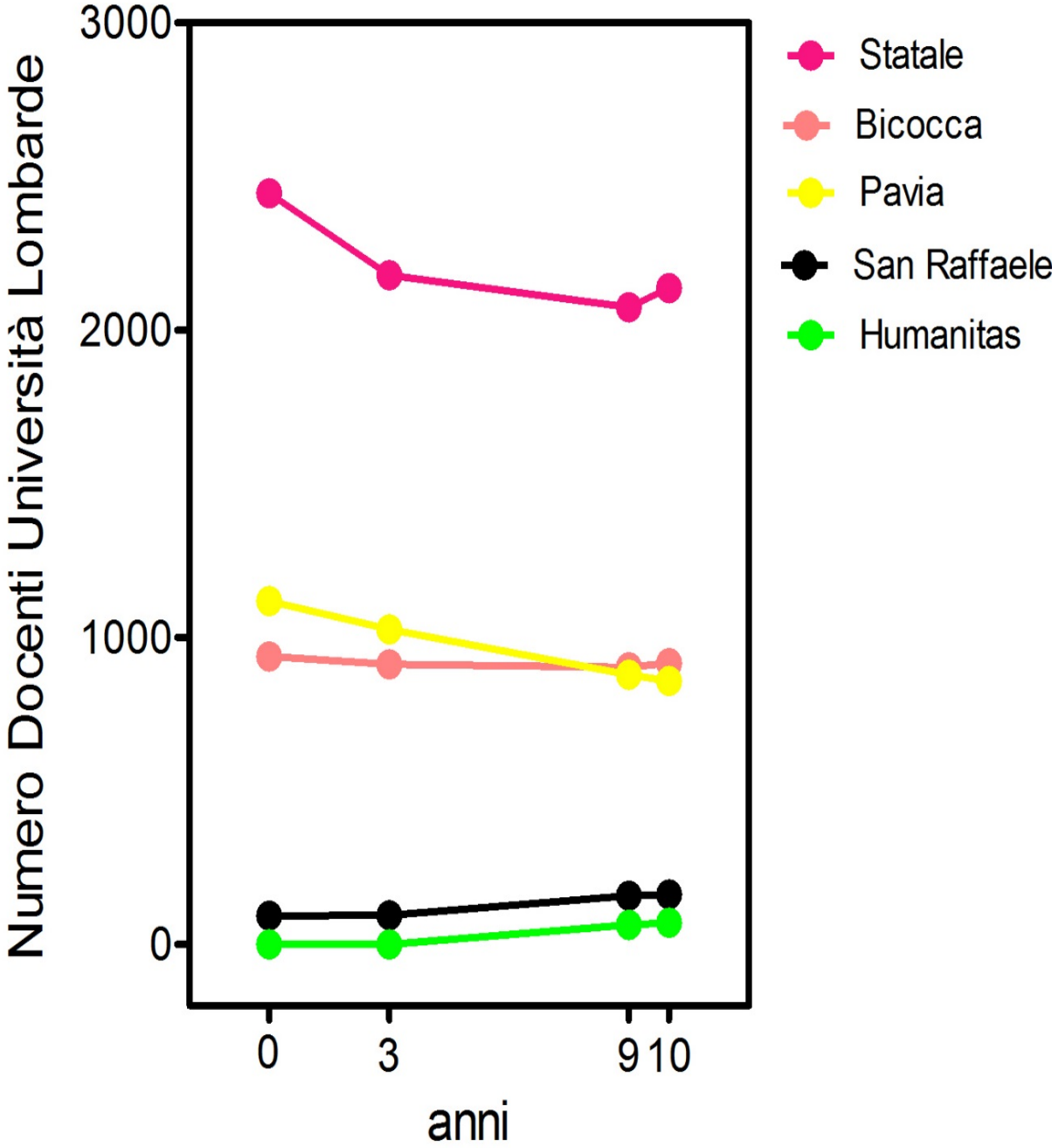
Pavia 2017 **117.220**

Pavia 2016 **119.562**

La valutazione della ricerca in Universita'
Luci e Ombre

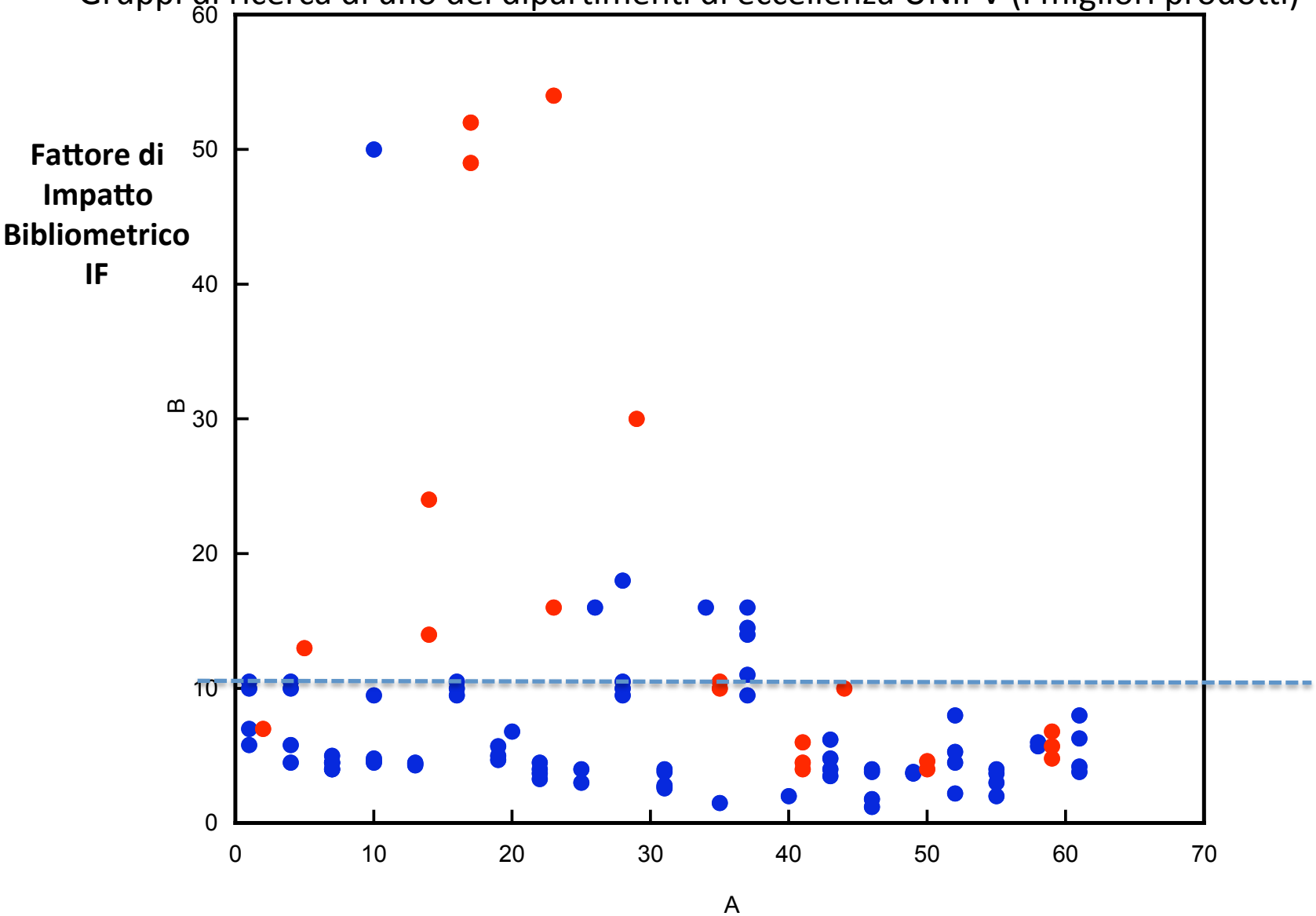
8Dati organico. Tutte le fasce

2008 31 dic	2011 31 dic	2017 31 dic	Novembre 2018			
				% ultimi 10 mesi		to
93	95	158	163	+4%	+ 43%	San Raffaele
937	911	902	917	+2%	-3%	Bicocca
2445	21179	20074	2099	+3%	-13.5	statale
0	0	63	72	+10%	+ 70 unita	Humanitas
1117	1025	878	857	-2.3	-23.1	Pavia
61053	50096	50443	50085	+1	-17%	Tutti statali
2688	3115	3732	3819	+3.5%	+30.5%	Non statali



Proprieta ext. Proprieta PV

Gruppi di ricerca di uno dei dipartimenti di eccellenza UNIPV (I migliori prodotti)



Univeristy College London
Internal preparation to REF 2021 ("VQR inglese")

Assess the quality of research outputs on its own merits: Do not rely on the Journal in which a paper is published or Journal Impact Factors as surrogate measures of quality, but form a judgement about the quality of the work based on your experience, scientific expertise, and knowledge of the field

The emphasis should be on the quality of the output, rather than the author's individual contribution, so long as you are satisfied the author made a substantial contribution.

Use of Citation data: **Citation** data for outputs should be used (available for outputs on RPS), where available and appropriate, as an indicator of academic significance to inform your assessment of output quality. Take into account **that if outputs have been published very recently**, they may have had too little time to be cited, and citation data may not yet be relevant to your assessment

Do not use other metrics, eg downloads, altmetrics. No guidance on this has been provided as yet by REF, but **these metrics are very unlikely to inform decisions about output quality**

Impact case study (REF3b)

Institution: University College London

Unit of Assessment: 1 - Clinical Medicine

Title of case study: Cell membrane biology in haemolytic anaemias: advances in diagnosis and treatment

1. Summary of the impact

Research at UCL on human haemolytic anaemias known as the 'hereditary stomatocytoses' has improved diagnosis of these conditions, meaning that patients now avoid unnecessary and potentially life-threatening splenectomies, and inappropriate investigation and treatment for raised potassium levels. Identification of a common single nucleotide polymorphism that causes apparently normal red blood cells to leak salt when cooled (as is normal procedure with donated blood) has raised awareness of this issue in the NHS Blood and Transfusion service, with the result that individuals with this condition have been identified among existing donors, and work is underway to develop a screening method to exclude such individuals from donating blood that cannot be stored safely. Finally, the research has facilitated diagnosis of the recessive metabolic

IMPACT CASE (REF)

Forte effetto coesivo e di "vetrina" sul territorio e internazionale

In collaboration with Dr Lesley Bruce (NHS Blood and Transplant) Stewart showed that these diseases can be caused by mutations in at least three different genes: *SLC4A1*, coding for the band 3 anion exchanger **[1]**; *RhAG*, coding for the so-called rhesus-associated glycoprotein, a gas channel **[3]**; and *SLC2A1*, coding for the GLUT1 facilitative glucose transporter **[4]**. Salt-leaky mutations in GLUT1 cause recognisable haematological-neurological-ophthalmological syndrome **[5]**.

In the course of this work, Stewart (in collaboration with Dr David Rees, King's College London) also showed that the rare hypercholesterolaemic metabolic condition phytosterolaemia can readily and inexpensively be diagnosed via a specific haematological presentation **[6]**. This is an important

temperature prior to separation of red cells from plasma during routine blood sampling, potassium leaked from the red cells and gave rise to factitious or 'pseudohyperkalaemia'. These patients were at risk of inappropriate referral to hospital and erroneous emergency treatment for the raised potassium.

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3. References to the research

[1] Bruce LJ, Robinson HC, Guizouarn H, Borgese F, Harrison P, King MJ, Goede JS, Coles SE, Gore DM, Lutz HU, Ficarella R, Layton DM, Iolascon A, Ellory JC, Stewart GW. Monovalent cation leaks in human red cells caused by single amino-acid substitutions in the transport domain of the band 3 chloride-bicarbonate exchanger, AE1. Nat Genet. 2005 Nov;37(11):1258-63. http://dx.doi.org/10.1038/ng1656 **IF 31**

[2] Stewart GW, Amess JA, Eber SW, Kingswood C, Lane PA, Smith BD, Mentzer WC. Thrombo-embolic disease after splenectomy for hereditary stomatocytosis. Br J Haematol. 1996 May;93(2):303-10. http://dx.doi.org/10.1046/j.1365-2141.1996.4881033.x

[3] Bruce LJ, Guizouarn H, Burton NM, Gabillat N, Poole J, Flatt JF, Brady RL, Borgese F, Delaunay J, Stewart GW. The monovalent cation leak in overhydrated stomatocytic red blood cells results from amino acid substitutions in the Rh-associated glycoprotein. Blood. 2009 Feb 5;113(6):1350-7. http://dx.doi.org/10.1182/blood-2008-07-171140.

[4] Flatt JF, Guizouarn H, Burton NM, Borgese F, Tomlinson RJ, Forsyth RJ, Baldwin SA, Levinson BE, Quittet P, Aguilar-Martinez P, Delaunay J, Stewart GW, Bruce LJ. Stomatin-deficient cryohydrocytosis results from mutations in SLC2A1: a novel form of GLUT1 deficiency syndrome. Blood. 2011 Nov 10;118(19):5267-77. http://dx.doi.org/10.1182/blood-2010-12-326645.

[5] Bawazir WM, Gevers EF, Flatt JF, Ang AL, Jacobs B, Oren C, Grunewald S, Dattani M, Bruce LJ, Stewart GW. An infant with pseudohyperkalemia, hemolysis, and seizures: cation-leaky GLUT1-deficiency syndrome due to a SLC2A1 mutation. J Clin Endocrinol Metab. 2012 Jun;97(6):E987-93. http://dx.doi.org/10.1210/jc.2012-1399.

[6] Rees DC, Iolascon A, Carella M, O'marcaigh AS, Kendra JR, Jowitt SN, Wales JK, Vora A, Makris M, Manning N, Nicolaou A, Fisher J, Mann A, Machin SJ, Clayton PT, Gasparini P, Stewart GW. Stomatocytic haemolysis and macrothrombocytopenia (Mediterranean stomatocytosis/macrothrombocytopenia) is the haematological presentation of phytosterolaemia. Br J Haematol. 2005 Jul;130(2):297-309. http://dx.doi.org/10.1111/j.1365-2141.2005.05599.x **IF 5.67**

[7] Gore DM, Chetty MC, Fisher J, Nicolaou A, Stewart GW. Familial pseudohyperkalaemia Cardiff: a mild version of cryohydrocytosis. Br J Haematol. 2002 Apr;117(1):212-4. http://dx.doi.org/10.1046/j.1365-2141.2002.03376.x

care and management has been paramount, facilitating an accurate diagnosis, enabling counselling and avoiding splenectomy for at least 30 individuals in the UK. One patient described the impact of these findings on her family as follows, contrasting those individuals who underwent splenectomy, with those who were able to avoid it as a result of Stewart's research:

> "*Over the years a number of the family have had their spleens removed either here or in Northern Ireland. Our own mother had a splenectomy and she died in 2004 with problems which were associated with blood clotting and Crohn's Disease. My elder sister has had the most problems including a blockage in a vein leading to the liver after her splenectomy and now has problems with bleeding from the gullet ... I have an aunt over in Northern Ireland who had her spleen removed and she had constant problems with her breathing. Those of us who have not had our spleens removed (which includes myself and my younger brother) are well with little problem or complication from DHS [dehydrated hereditary stomatocytosis]. We have another aunt over in Northern Ireland who did not have her spleen removed. She had 12 children without any major problems. We have anaemia, and we need occasional transfusions (not all of us), but none of the breathing problems or other complications which other family members have experienced*" **[a]**.

A further impact of accurate diagnosis is the correct understanding of high plasma potassium levels. In about half of the cases, high plasma potassium levels have been explained on the basis of leaky red cells, removing the need for repeated urgent hospital attendances for repeat potassium measurements. A patient described the impact on her family as follows:

> "*High plasma potassium levels… were a bother to us all as, after any blood test we would be recalled to hospital as an emergency… One thing that has changed our lives is the recognition that our habitually very high plasma potassium levels are due to the abnormality in the red cell membrane. This new understanding has saved us countless late-night hospital visits for urgent repeat potassium measurements*" **[b]**.

This work has been widely cited and included in standard textbooks on this subject **[c]**.

Testimonianze indipendenti

Impact case study (REF3b)

5. Sources to corroborate the impact

[a] Testimony from Patient CM. Copy available on request.

[b] Testimony from Patient SB. Copy available on request.

[c] For example: Handin R, Lux S, Stossel T, editors. Blood: Principles and Practice of Hematology. Philadelphia: JB Lippincott; 2003. See chapter on Disorders of the red blood cell membrane, p.1709-1858. Copy available on request.

[d] Statement provided by Senior Research Scientist, Bristol Institute for Transfusion Sciences, NHS Blood and Transplant, corroborating effects of cooling on blood from donors; the identification of such individuals among existing donors, and the ongoing development work. Copy available on request.

[e] Wang G, Wang Z, Liang J, Cao L, Bai X, Ruan C. A phytosterolemia patient presenting exclusively with macrothrombocytopenia and stomatocytic hemolysis. Acta Haematol. 2011;126(2):95-8. http://dx.doi.org/10.1159/000327248.

[f] Neff AT. Sitosterolemia's stomatocytosis and macrothrombocytopenia. Blood. 2012 Nov 22;120(22):4283. http://dx.doi.org/10.1182/blood-2012-06-429449

[g] Testimony from patient PP. Copy available on request.

"IL TAVOLO"

Infine non dimentichiamo I ricercatori e i medici in formazione (almeno 1500) (potenziale punto di forza)