

Could You Patent the Sun?

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I got vaccinated the other day, and as I stepped forward with my sleeve rolled up, as part of a well-orchestrated flow of hopeful-eyed 50-somethings, Salk's important question¹ was rattling in my mind. Ostensibly, this was just one remarkable facet of an ongoing global triumph against adversity. A year to the day, give or take, that my country like many others was put into a first lockdown, one-half of the adults in my country have now had their first immunizing injection against the disease that has thumped us hard. I stand here in a wonderfully egalitarian process selected based on risk (my age) next to, by chance, a Warden of one of the Oxford colleges. Access is free; money buys no privilege. Our Prime Minister was immunized on the same principles only the day before; need dictates treatment. There is fairness in that, at least in this microcosm.

It has been repeatedly stated just how fast we have learned to move as a global scientific community over the last year—and few aspects of that are in doubt. It makes me smile very much. In the very city that I write from, one of the vaccines was designed, trialled, developed, and, in some ways, given to the world by academics. All to the good. But have we moved as a global scientific community in all respects? Why is there odd guilt? Why do Salk's words still rattle? Well, my nagging seed of doubt may be one that his question should raise in us all perhaps? The vaccine that has now spread from my upper arm is, unlike his gift to the world (his "sun"¹), still managed "intellectual property" (IP). In this, perhaps the most testing (and perhaps triumphant) moment for medicine in mankind's history, we have continued to adopt an approach that might have left him somewhat incredulous. Even this vaccine in me, chAdOx1-S, which is rightly being celebrated for being distributed at no profit during the pandemic,² is nonetheless not truly, freely available. Yes, a bilateral agreement to allow licensing to, for example, the Serum Institute² should be applauded (along with licenses for technology transfer to ~20 subsites), but I suspect that Salk would have still

raised an eyebrow even at those measures. Could we be braver still?

Why do Salk's words still rattle?

The World Health Organization has highlighted that now may well be a pivotal moment for how we consider the morals and the ethics of intellectual property—not just the things that are made "patent" but also the know-how and techniques that are not.³ Can we really as scientists anticipate that a global maximum capacity of ~2–3 billion vaccine doses per annum in 2019 (for protein conjugates primarily)⁴ will translate into ~10–20 billion doses needed now (for "nonprotein" immunogens primarily)? And, if not, should we not then be recruiting the widest global collaboration based on transfer of knowledge and skills to empower all? Some would argue that we have failed globally on many fronts over the centuries, often due to vested interest or established, embedded issues. But does this not represent a fresh chance to do better? A global challenge could and perhaps should be met *globally*, not just by the current translational methods (that some suggest have been designed to be controlled/curtailed by primarily commercial levers) but rather by the central underlying ethical needs.

This seems a slightly grubby approach to science.

Yet, as we know, such practices run deep now in aspects of science. Unlike Salk, the current academic generation appears to accept this. We are all rightly encouraged to consider "impact", but perhaps too often that impact is

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viewed only through the lens of commercial translation/spin-out, etc; impact means of course so much more. The potentially corrupting ethics of commerce versus intellectuality are often overblown, but there is merit in being wary of some of the possible conflicts that can arise from claiming IP. Other, much more minor, examples beyond the pandemic have also struck a chord with me over the last year, reminding me that there are dangers in this often-accepted approach. These were examples central to my field of exploring chemistry in biology: for this, commercially available biomolecules are now designed and sold as complete, off-the-shelf research reagents. Yet, in many cases, the terms that one is forced to accept upon purchase (even for public research using tax-payer and charitable money), are, when you examine them, somewhat surprising. In essence, not only are researchers not allowed to know what these reagents actually are in detail (little or no molecular characterization, e.g., sequence or structural information or details on how they were made or what precisely they interact with at the molecular level), but also the vendors may claim rights on further discoveries made with them by others.

To play devil's advocate, people will reply that assertion of IP rights in this way is intended to "incentivize". But beyond this euphemism, is that really the motivation for the scientists who develop things? For the Salks? It can be argued that the current systems of IP also create active disincentives. Many systems are simply not pursued nor developed nor used if there is no so-called "freedom to operate", even if they might have potentially led to real translational benefit—this can therefore curtail the development of certain discoveries. This in some ways then creates a scenario of molecular "rent-seeking" coupled with the need for blind faith that such reagents "just work" without knowing what they are in detail. Indeed, if one does characterize such reagents, e.g., through sequencing, then the vendors can further assert their rights to try to prevent the community from knowing this data. This too has become common practice (many of us use antibodies all the time, for example), but it seems to run counter to much that we hold dear as academics when we, as a community, routinely open ourselves up to rigorous peer review as a matter of course, warts and all.

Is it not now time for a rebalancing of our approach?

We could and so perhaps should do better; this seems a slightly grubby approach to science that in nearly all cases is being "paid for" by society (in one way or another). This

assertion of "IP rights" might help motivate some, but it might also threaten to undermine the admirable emerging aims of transparency in "open science". Without wishing to appear naïve and to put it more directly: How can science be truly "open" if the very things that we use as tools and as therapies are somewhat opaque, constrained, and/or curtailed?

Perhaps it is just my own guilt (at being so lucky/privileged to now have some building immunoprotection) that whispers in my ear, but a voice is nonetheless saying: if we get this wrong and continue to default to letting science be always run by the global tendency for "rent-seeking" (based on communal scientific efforts), then we may all regret this opportunity for change. Is there not a middle way?⁵ Is it not now time for a rebalancing of our approach? Again, I like to think that I know what Salk would have said.

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Notes

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REFERENCES

- (1) When Jonas Salk, inventor of the polio vaccine, was asked by Edward Murrow in 1955 (April 12) on the United States CBS television show *See It Now* the question "Who owns the patent on this vaccine?", he replied "Well, the people, I would say. There is no patent. Could you patent the sun?" The campaign for the development of that vaccine was also a communal effort, largely trialled by recruited volunteers and supported by many public donations.
- (2) AstraZeneca takes next steps towards broad and equitable access to Oxford University's COVID-19 vaccine. <https://www.astrazeneca.com/media-centre/press-releases/2020/astrazeneca-takes-next-steps-towards-broad-and-equitable-access-to-oxford-universitys-covid-19-vaccine.html>.
- (3) Waive Covid vaccine patents to put world on war footing. <https://www.who.int/news-room/commentaries/detail/waive-covid-vaccine-patents-to-put-world-on-war-footing>.
- (4) Sparrow, E.; Wood, J. G.; Chadwick, C.; Newall, A. T.; Torvaldsen, S.; Moen, A.; Torelli, G. Global production capacity of seasonal and pandemic influenza vaccines in 2019. *Vaccine* **2021**, *39* (3), 512–520.
- (5) For example possible "middle ways" that have been suggested by others in the few days that this was in proof see: (a) HHS is urged to use its patents for the Moderna Covid-19 vaccine to widen global access. <https://www.statnews.com/pharmalot/2021/03/25/covid19-coronavirus-vaccine-moderna-patents-nih-hhs/>. (b) <https://static1.squarespace.com/static/5e937afb7d7a75746167b39c/t/605c7d657cca1206e17b4d87/1616674150606/Moderna+and+the+070+Patent+24+March+2021.pdf>. (c) DG calls on COVID-19 vaccine manufacturers to increase production in developing countries. https://www.wto.org/english/news_e/news21_e/dgno_09mar21_e.htm.