Dividing the Spoils of CRISPR: Surrogate Licensing and Scientific Discovery

Jorge L. Contreras
University of Utah
S.J. Quinney College of Law
Dept. of Human Genetics

Jacob S. Sherkow
New York Law School
Innovation Center for Law and Technology

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RA Michael Eixenberger

Jake Sherkow, co-author

CRISPR’s “inventors” and competing patents

Jennifer Doudna
UC Berkeley

Emmanuelle Charpentier
U Vienna

Feng Zhang
Broad Inst.
Patents and Licenses

- IP rights are **divisible**
- Patent rights can be **licensed** in different Fields of Use
- Licensee usually pays Patentee a **royalty** based on net revenue from exploiting the patent
- Licenses can be **exclusive** or **non-exclusive**
## Scope of CRISPR Licenses

<table>
<thead>
<tr>
<th>Field</th>
<th>Exclusivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-commercial research</td>
<td>Non-Exclusive</td>
</tr>
<tr>
<td>Tool Development</td>
<td>Non-Exclusive</td>
</tr>
<tr>
<td>CRISPR Applications</td>
<td>Non-Exclusive (mostly?)</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Non-Exclusive</td>
</tr>
<tr>
<td>Veterinary</td>
<td>Non-Exclusive</td>
</tr>
<tr>
<td>Human Therapeutics</td>
<td>Exclusive ($$$)</td>
</tr>
<tr>
<td>[Human Enhancement]*</td>
<td>None</td>
</tr>
</tbody>
</table>
The Human Therapeutics Field is BIG

- Approximately 20,000 human genes
- Field covers every edit to address every disease using every gene
The “Surrogate” Licensing Model

University cedes exclusive control over a large and lucrative market to a private firm that is not aligned with the university’s public mission.
The standard case for exclusive licenses in biopharma

- Provides greater financial incentive to develop technology
- Enables R&D cost-recovery during exclusive period
- Enables external fundraising (VC + markets) to support commercialization
- Allocates sublicense identification, recruitment and negotiation role to experts
But not for “research tools”

NIH (1999)
Patents on research tools developed using federal funding should be licensed non-exclusively to promote their greatest utilization, commercialization and public availability.
University Licensing – Nine Points (2007)

1. Research exceptions
2. **Limited exclusivity for research tools**
3. Minimize future improvement licensing
4. Manage tech transfer conflicts
5. Ensure broad access to research tools
6. Limited enforcement
7. Export regulations
8. Be careful of patent aggregators
9. Developing world provisions
*Is CRISPR a Research Tool?*

- It is a broadly applicable *technique*
- But CRISPR edits may themselves be therapeutics
- *But* CRISPR is so broadly applicable that it is *like* a research tool

→ **CRISPR should be licensed broadly and with narrow exclusivity**
Effects of Surrogate/Exclusive Licensing for Research Tools

- **Firm** profits substantially from control of field
- **Inventors** and **university** profit substantially from equity in firm
- Firm is not bound, legally or morally, to university’s public mission
- University pays lip service to public goals, but avoids compliance with 9 Points and public mission
- Development is **bottlenecked** by single firm choke point/control over rights
A Development Bottleneck

Assume: 100 firms capable of developing a CRISPR human therapy

**Model 1 (PCR)**
- University grants 100 firms a non-exclusive license in a limited field (one disease or gene)
- 100 therapy targets created over 5 years
- Avg. university revenue = low

**Model 2 (typical biotech molecule/indication)**
- University grants 50 firms an exclusive license in a limited field (one disease or gene)
- 50 therapy targets created over 5 years
- Avg. University revenue = medium

**Model 3 (Surrogate – CRISPR)**
- University grants one surrogate exclusive rights to entire field
- Surrogate focuses on 5 targets, 20 on “back burner”
- Surrogate exclusively sublicenses/options 25 targets to others
- Avg. University revenue = high

→ But results in least development
  → Surrogate may not be optimal developer of all 25 targets (competitors foreclosed)
  → Surrogate cannot develop all targets simultaneously -> time lag
A New Hope for CRISPR?

- With two key sets of patent rights, Broad and Berkeley may have to renegotiate and deal with each other.

- Licenses to surrogates can be made non-exclusive or limited to specified candidate genes.
Thank you!

Jorge L. Contreras
University of Utah
S.J. Quinney College of Law
Salt Lake City, UT
jorge.contreras@law.utah.edu
SSRN page: http://ssrn.com/author=1335192