Barbarian Horde, Competing Gangs, or…? Alternative Social Group Metaphors and their Implications for Cancer Research

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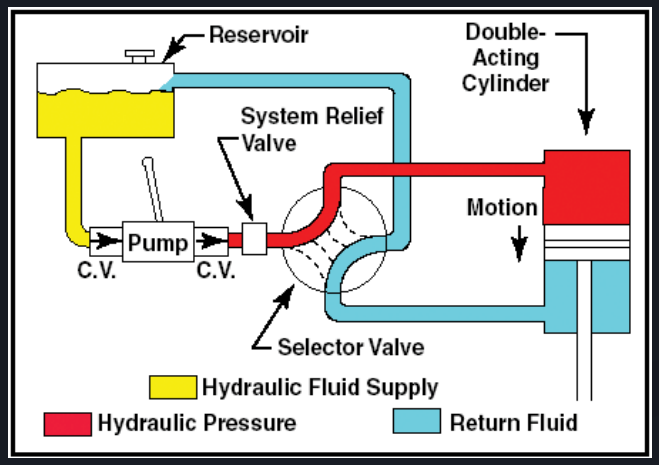
Metaphor: The Promise is the Pitfall

- Metaphors have implications, which is why they are scientifically useful *and p*roblematic
  - In Psychological Science
    - Motivational/Emotional Processes as Hydraulic Systems
    - Mind as an IBM Computer



Dominant Cancer Metaphor

- Tumor as an Invading Barbarian Army
  - "War on Cancer," "Battle," "Brave and Courageous Fight," "magic bullets,"…
  - Our data

A Barbarian Horde…

- … is an invader, from outside the self; it's not "of us"
- … is perceived as homogeneous (like all outgroups)—members share common "essence," possess singular intent ("they all look/act the same to me")
- … aims to destroy us; it has no investment in our well-being

So we must destroy or expel it before it destroys us!

(Cure, not Control)

- … is a conventional enemy, implying the usefulness of conventional, symmetrical defense/warfare

But problems with the metaphor…

- Cancers are of the self
- Tumors are heterogeneous
- Cancers die when we die; our destruction is a byproduct of its success, not its "aim"
- Cancers are an unconventional enemy, suggesting the possible usefulness of countering with creative, asymmetrical defense/warfare
- Etc.

Alternative metaphors?

- External Terrorist Group?
  - Better: Unconventional enemy
  - But: Outsider; homogeneous; intent on destroying us
- Internal Terrorist Group?
  - Better yet: Unconventional enemy; it's of us
  - But: Homogeneous, intent on destroying us

How about…

Tumor as Competing Criminal Gangs

- Like cancer cells, they are of us; Cells gone bad = Community members gone bad.
- Heterogeneity: Just as a tumor contains heterogeneous groupings of cells, a local community may contain multiple (and somewhat distinct) criminal gangs, whose interests aren't shared.
- Like cancers, gangs don't "want" to destroy a local community but rather to exploit it. Damage to body/ community is a byproduct.
- Like cancers, gangs are unconventional enemies, suggesting the need to counter with creative, asymmetrical defense/warfare
- Like cancers, which evolve within particular micro-ecologies, gangs "evolve" within particular communities ["harsh communities"]

Interesting Parallels re: Challenges to Successful "Treatment"

- Surgery/Chemotherapy = Mass arrest of gang members
  - Problem: Like many cases of tumor extraction, mass arrest is unlikely to be an ultimately successful solution unless one gets the whole group, because gangs are dynamic and often loosely structured and can often readily regroup.
  - Problem: Like chemotherapy, mass arrest doesn't work wonderfully because those who successfully avoid arrest (1) are resistant to this type of police action, (2) will be harder to catch subsequently without a change in policing strategy, (3) now have a more open niche to play within, giving them access to greater resources with which to support their criminal activity, and (4) are likely to reproduce (recruit new members) who share similar characteristics.
- Sending gang members to prison "up state" = metastasis

Implications for Research/ Treatment Strategies?

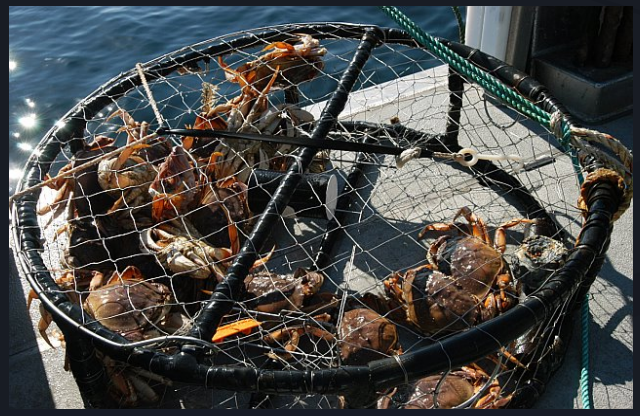
- Like cancer cells, gang members are "of us"; Cells gone bad = Community members gone bad.
  - **Prevention: Build & Empower Strong Families/Communities = Build Strong Micro-Ecology**
    - Are there ways to alter an ecology to stop member cells from developing into cancer cells? To slow their reproduction once mutated?
    - Are there ways to alter the local ecology of normal cells such that they would more effectively use the resources required by mutant cells?
  - **Identification, Stigmatization, & Re-Socialization**
    - Are there ways to enhance the body's ability to identify mutant cells earlier and speed up responses to them?
    - Are there ways to "re-program" cells gone bad?

Implications for Research/ Treatment Strategies?

- Heterogeneity: Just as a tumor contains a heterogeneous collection of clones, a local community may contain multiple (and somewhat distinct) criminal gangs, whose interests aren't shared.
- **Leverage Intergroup Competition**
  - Maintain Balance of Power: Can one enhance the success of less pernicious clones to manage the growth of more pernicious clones (as one might "help" a more populous, but relatively more benign gang maintain its standing so that it continues to access a large share of the resources needed by smaller, but more dangerous, gangs)?
  - Send Them "to the Mattresses": Can one direct/"teach" cancer clones to attack one another, or otherwise facilitate competition with one another, thereby keeping them busy and reducing the resources/energy they can allocate to reproduction? Can one make cancer cells appear to be normal cells so that other cancer cells direct their devious tricks towards them?
  - Introduce relatively benign cancers as competitors? [as in bio-pesticides, etc.]

Implications for Research/ Treatment Strategies?

- Like cancers, criminal gangs don't "want" to destroy a local community but rather to exploit it. Damage to body/community is a byproduct.
- **Are there alternative ways to enable cancers to reproduce and enhance fitness without doing as much damage to the body?**
  - "Crab traps": Can one attract existing cancer cells to desirable but controllable ecologies? For example, removable 'traps' baited with relevant cues and desirable resources?
  - Create cooperation: Could there be any productive *uses* w/in the body for cancer cells?



Implications for Research/ Treatment Strategies?

- Like cancers, gangs are unconventional enemies, suggesting the possibility of countering them with creative, asymmetrical defense/warfare.

- **Unconventional warfare**:
  - Intelligence gathering: Can one create better sensors (technology) to detect cancer early? Can one create better sensors (biological) —a la undercover cops, spies—within the body?
  - Early disruption/harassment: Can one use this intelligence to create ecological disturbances/distractions to make it difficult for cancers to gain traction? [a la Stuxnet virus; Pgp pumps]
  - Infiltration: Attack from within, by cells disguised as cancer cells?

Implications for Research/ Treatment Strategies?

- Like cancers, which evolve within particular ecologies, gangs "evolve" within particular communities

- Enhance strength of local bodily ecology, normal cells
  - Earlier examples
  - Suggestions from other talks
  - Can one enhance the ability of normal cells (or the immune system) to adapt to evolving cancer cells, to enhance their ability to generate and/or employ alternative strategies?
  - Can one 'seed' a local bodily ecology with biological critters designed to constrain cancer cells and evolve to address subsequent adaptations by the cancer?

Final Comments

- Very different implications of "invading barbarian" versus "competing gangs" metaphors; metaphors both illuminate and blind
- Fundamentally, the "criminal gang" metaphor, unlike the "invading barbarian horde," suggests a greater focus on *cancer control* versus *cancer destruction/cure*.
- Like all metaphors once entrenched, "criminal gangs" will carry perils along with whatever promise (if any) it may have.
- Usefulness of Metaphors for Generating Questions and Hypotheses… but Not Answers.
- Thanks to Virginia, Athena, Carlo; and Joel Chabrier