

Golden Berries

Part 1: A New Therapeutic Dawn

A tickling sensation exerts on my capsid as a fellow phage's tail fiber collides out of nowhere. I twitch in relief with the reassurance that I am not alone. Of this I am constantly reminded when in doubt. I can't see them but I can sense their presence. They're just everywhere.

"Move over, this media's a shared space" one of the many virions makes it known.

I'm revived from my lost thoughts through my comrade's piercing impatient tone. Our numbers easily surpass 10^3 cfu, and aggravation augments as we anxiously await our mission. The tension in here, I could cut it with my tail pins.

"What's the matter, still dizzy from the revolutions? I said move! Not much upstairs is there."

Valid point, we all have a few kilobases beneath our capsid coating.

I spasmodically jerk forward and turn a little, mind you still remaining in the same spot. It's about as much as any of us can manage at the moment, before our great mission. The concept of motility is a far cry from our current confining sedentary lives: for this reason, it's exhilarating. Our time will come, as we were hardwired for this very purpose: we simply must reunite with *Staphylococcus aureus*, it's in our DNA. We must overcome our phobia of entrapment in that sticky stuff, I forget its name.

The lysing incident was a blur to the majority of our plaque, dream-like in a sense, almost as if it never occurred. But I remember it like it was yesterday. I remember how stories of the older generation were told with pride. How they embarked in solidarity on the surface of *S. aureus* and inserted themselves through the stubborn intricate glycans. How they endured through that sugary, viscous cobweb of suffocation – a horror from your worst nightmare would be a gross understatement. They faced the most gruesome terrors headstrong for us, and now we must do the same. We must reminisce the thrill of our explosive liberation: moments after emergence, by-passing the eerie remains of capsule shelling in the midst. No amount of centrifugation could ever make me forget. Forgetting would be careless.

"We're doomed, we'll never see light again" says another. I look back. What a strange thing to say, of course we're doomed. We'll never be the same again, what's there to fear? Fear failure instead. Our simple genome programs us to do one thing only - it's all we're defined by. At the very least appreciate being goal-driven, uncertainty is a lot scarier.

"You certainly are" laughs another. "With those puny pathetic little tail fibers of yours, diffusion is out of the question. The *biofilm* will get you for sure". Oh, that was the word. Biofilm.

Ah, yes, that adhesive icky matrix of *extracellular polymeric secretions*. Despite its intimidating reputation, I find a certain solace in knowing *S. aureus* fears us as we fear it. It's sheer cowardice encourages the beast to form such stationary collectives, shielded by this very substance I speak of. Fellow virions fear that some *S. aureus'* biofilm is too impenetrable, as they recall even the mighty methicillin was unable to pierce it on multiple occasions. They, of course, speak of a new variant we're probably unlikely to encounter ourselves. I believe some call it the MRSA.

"I'm trying, with great obscurity, to conjure up an action plan for when I encounter it" I blurt out. "Maybe I'll dive capsid-first towards its body, through the biofilm if there is one. Turn vertically and reveal my jagged base plate when I come into contact with its wall".

Silence falls on the entire media. I have the spotlight.

"I'll have to make sure I widen my tail fibers to encompass sufficient surface area. To facilitate the landing of course". My words echoed, lingering in harmony alongside the piercing wisps of fluttering tails and slight sheath contractions.

"What, like some sort of solo paratrooper? You must be out of your mind".

An antagonistic chill overcomes me.

"When will you realize we attack in coordination with one another? In unison. As a team. That's the only way we succeed."

"We must outnumber them – overburden them – rid them of their ability to fend. We will coat and cling, as leeches do when they latch on. We're not to give a moment to spare – push, push, push through and insert! Once we're in - we're in! It'll be like entering a treasure chest of organic matter– we reassemble with its reservoir. We assume charge of the manufactory and orchestrate its processes. Or we overwhelm its insides with our progeny and rupture it to destroy. It's up to us to decide. Parasites need to collaborate."

Part 2: Left Behind

It all went black for a while. And quiet. Very quiet. My memory blanked. Where am I? Have I been injected? Am I in the injection? Where is everyone?

With immense ease, my train of thoughts outpaced the gentle stream of external forces, sweeping me to an unknown destination I have yet to consent to. I feel powerless, helpless, alone. I am bewildered as my confidence is drained from within. I don't feel like myself anymore.

I attempt to turn around, create some sort of movement. I try recoiling my sheath and stretching my tail tube. My sheath - unable to contract. My tail tube - as still as a tomb.

My whiskers begin to tremble as my memory is finally able to make some traces. The cocktail was placed in the injection, and we, placed near the site of infection. Our troop must have dispersed.

I suddenly feel a structure pressed on the other side of my capsid as I bump into an unknown unit. It must be *S. aureus*, it has to be – my time has come. I instinctively reorient and propel myself towards the body, by far the most I've ever moved. I masterfully land my tail fibers and prepare for insertion. Then it hits me. I've landed on no microcapsule. I've penetrated no biofilm. It's a regular cell membrane with protruding glycocalyx structures. I've mistaken an endothelial cell for a pathogenic superbug.

Get it together and translocate this blood vessel. Once you enter the bloodstream, locate the site of infection and help your friends with the invasion. Or get lost in the abyss forever.

I wedge myself in between two endothelial cells, through the vessel. I am now moving in unity with the host tissue – large warm red bodies floating forward in a directional manner within amber solution. I decide to follow them, not that I'm able to do much else given my immobility. I am illogically reassured. Why do I feel certainty when my dire circumstances are unaltered?

All of a sudden, the vessel walls begin to widen. I panic yet I cannot prevent myself from moving forward. My mind – racing now more than ever. The fragile squamous walls are almost unsalvageable, and appear to be destroyed right ahead. Then, in the distance, I look in fear as I am faced with multiple milky white bodies submerging themselves ruthlessly inside the lumen. They are large and armored, formidable to the highest degree. They look like they're ready to kill.

Is this a hallucination? It's too real. No. This is real.

The pale devils take no interest in me. Curiously, they all speed through the lumen in the direction I am headed. I feel insulted. Why didn't they acknowledge my presence? I'm foreign, why didn't that at least raise their suspicions? And why are we all headed towards the same direction?

It turns out I'll have found out too late.

Part 3: Is it sticky in here?

I regather my consciousness as I exit the tunnel of ordeal. I can sense I am now in a larger and sounder place. I'm thankful to relieve myself from purgatory and asphyxiation. Although I still remain disconnected with the other virions from my cocktail, their whereabouts still very unknown.

The place I'm in – its structured beautifully. The walls are smooth, very much like the ones of the vessels I encountered. They're impressively elastic and organized. I hear a pulse-like beat shuddering – vibrating the surrounding walls. I am thrusting downwards, indefinitely closer towards the origin of the bizarre sound.

It was at that moment I reached my final destination.

The place is completely illuminated. After lengthy periods of darkness, it is certainly attractive. My instincts are aroused and I'm mesmerized. It appears as though I've entered a giant's garden of paradise, with glimmering wispy white branches bearing bountiful bunches of ripe golden fruit. They're round, circular, and tempting – inviting from a distance. Their gold light shines all around me, like interconnected chandeliers among white clouds.

My fascination as I'm drawn closer and closer into the alluring network is interrupted as I spot my former foes – those dreaded white monsters. I watch in shock as they gnaw at the web of berries. I'm truly disgusted by how disruptive they are for no apparent reason.

Knock it off!

My gradual movement is abruptly halted as I feel every fiber and projection of my viral structure frozen. I try to bend and push forwards. I am unable to even fidget, move in any Brownian way. I see surrendered gaunt phage corpses sprawled out lifeless amidst the smothering deadly white glue that surrounds me. I make a chilling discovery as I reunite with my fallen comrades.

I'm **entirely** and **permanently** entrapped within the **biofilm** of ***Staphylococcus aureus***.

I see them up close now, their true faces projected on to mine. Their merciless colonization and pathogenic motives. Their shameless greed and desire to endlessly multiply. The cunning manner in which they evolve – in their case how they thickened their biofilm to maximize its weaponry. An attack within a defense. I'm a victim to my very own parasitic design, and I have succumbed to our collective desire.

I have not moved since.