

24 *Proof of Principle*

I awoke on Monday morning with a sense of tightly-wound expectation. As soon as I opened my eyes my thoughts took up precisely where they'd left off when I'd finally fallen asleep: Gina was due back, and *something* was bound to happen.

As I'd lain in bed the previous night, I'd envisaged many scenarios: Gina being immediately sensible and going to Boyd with my evidence; Gina being in denial and needing to be persuaded; Gina believing me, but deciding to take up the matter privately with Rouyle. There were many other permutations, but I'd just have to wait and see. And meanwhile, I had to squeeze in time to tell Christine the whole story as well as talk with Ainikka about the *Arch Lat Psychiatry* translation.

I have to admit that in all the excitement, I'd completely forgotten about the mice.

When I stepped into the lab, its cheerful normality made a surreal contrast to the close-circuited anxiety of my journey in. I forced myself to respond to the chorus of greetings, with a special smile and nod in Magritte's direction. I'd managed to get seven hours' sleep, had shaved and had taken care to dress respectably. She subjected me to careful inspection and seemed satisfied.

"Andy, my lad," Paul said in a stage whisper, descending on me as I was starting up the computer. "How'd it go Friday night?"

I shrugged, produced a self-conscious smile. "You were right...I am definitely in with a chance."

If he found out the truth, I would never hear the end of it.

"Playing it cool, then?" He nodded wisely. "Sounds sensible, mate."

"Paul," Marcy called over, using the polite tone she reserved exclusively for asking favours. "Can I steal some of your Lac-zed DNA for my transfection? And can you show me where it is...*now*?"

Paul rolled his eyes as he moved away, and I clicked into my e-mail, eager to see how Gina had reacted to the CD.

My Inbox was crammed full of junk—and only junk.

I was so astonished that I ran down the list of senders a second time in case I'd missed her name. Could it be that she hadn't had a chance to look at the CD last night? Maybe Rouyle had been sticking close. She couldn't possibly have failed to notice the conspicuous gift lying on top of her other mail. Or had she missed all the hints and not realized that something was hidden under the music CD, in which case she probably thought I was extremely odd as well as pathetic? Even if all else had failed, there was still the imperative e-mail I'd sent her on Thursday. Why hadn't she got in touch?

A hand landed on my shoulder, dispelling my fretful funk, and I ducked unsuccessfully as Christine planted a purposefully sloppy kiss on my cheek.

"*Oi!* What was that for?" I wiped my face with my sleeve, relief coursing through me in an unexpected rush at the sight of her.

She pulled up a chair, emanating smugness. "For whatever you said to Cam on Saturday night. We had a long conversation about things on the phone afterwards, and then yesterday we stayed up half the night talking."

"And?"

"Everything's...well, perfect, Andy. And I'm not letting you wriggle out of responsibility for your part in it."

I forced myself to set aside my troubles for the moment. "I'm glad. And the job?"

"They still have to interview a few more candidates, but they've hinted that's just a formality."

"Sounds as if you're going to take it if they offer, then."

She nodded, eyes going dreamy.

"Listen," I said. "That's great, but I've got something really important to speak to you about, in private." I lowered my voice still further. "It's to do with those *in vitro* tests I ran, and a few other things."

She looked at me curiously. "Okay, but first I should go upstairs and check on the baby," she said. "See how... it...got on over the weekend. Have you seen *her* around yet?"

"No, but if you see her first, could you tell her I've got something urgent to tell her?"

"I'll bet you do," Christine said, still studying my face solemnly.

I passed the time doing some calculations for the mass of transfections I wanted to perform in the afternoon, entering strings of numbers without much thought. I was just toying with the idea of sending another, not-so-subtle e-mail to Gina or going downstairs in person when my mobile rang.

"Andy, there's something massively wrong up here." Christine's voice contained an element I had never heard in it before: *fear*. "Meet me at the Smoker's Wall in five minutes. And have you found out where the hell Gina is yet?"

"No, I haven't," I said calmly, for the benefit of my audience. "Coffee sounds great—see you down there."

I hung up as coldness began to diffuse throughout my body.

When I entered the crowded lift, Christine was already inside, on her way down from the animal facility. She just looked at me, emotions barely under control during the descent, and we made our way out to the Wall in continued silence, the leaden sky sagging down on us.

I hunched up, wishing I'd brought my coat as the cold pierced my thin cotton T-shirt. Christine seemed oblivious to the temperature as she attempted to light a cigarette with shaking hands, but the wind was too strong. I cupped my hands around hers until the tobacco caught fire.

"*Jesus,*" she breathed, a stream of exhaled smoke snatched away by the wind.

"It's the mice, isn't it?"

She nodded darkly. "They're in trouble, but Gina moved them into the virus isolation room on Friday morning, so I can't get a good look at them—my keypass isn't coded for it."

"How do you know there's something wrong, then?"

"I can see our cages through the observation window, and the ID tags are legible." The wind pushed a skein of brown across her face, and she turned her head to allow the hair to whip up and away. "Our mice are just lying there—all the rest of the animals in the room are scurrying around, waiting for feeding time."

"Are they dead?" My earlier fear coalesced into an indigestible stone.

"I have no idea—I can't tell from the window. But that's the least of our worries: if anyone notices, Theresa will be informed and then we're finished."

Rain splattered against my face, reminding me that this was actually happening.

Christine took another shaky drag. “Theresa throws a fit if a mouse even sneezes out of line—she’s terrified of a repeat of that coronavirus epidemic we had a few years back. Inquiries will be made, and Gina won’t be able to come up with a good reason for the pathology, and certainly won’t be able to match the ID tags to any approved project license.”

“But surely Gina’s taken precautions in case the mice reacted badly—it was one of the logical possibilities.”

“Yes, but Gina’s not *here!*” she snapped. “I called down there and nobody’s seen her. I can’t *believe* she’s left me alone in this mess with no way into that room! Are you sure she was due back last night?”

I paused, realizing I wasn’t so sure anymore. “Maria mentioned a weekend break, that she’d be back on Monday. But not what time.”

It hit me then that if Gina were still en route, she might not stop home first. If so, she wouldn’t know anything about the CD or my e-mail, although the mystery protein was surely trumped by this alarming new development.

“Later would be too bloody late!” Christine’s voice rose in pitch, and she stood up. “Theresa makes rounds right before lunch. And someone else might stumble across them earlier—like that horrid Steve person. *He’s got access.*”

I put out a hand to prevent her flight, finally starting to think clearly. “Wait, I’ve got an idea: we can go to Maria for help. She’s probably authorized for virus work.”

“We can’t risk telling anyone else.” Chris glared down at me, struggling to free herself from my grip.

“She already knows.”

“You *what!*” Christine exploded. “How could you have been so bloody stupid, Andy, to —”

“I didn’t tell her!” I stood up too, grabbed her by the shoulders. “Just calm down and *listen.*” I explained what had happened, then said, “Now, does Maria have access or not?”

Christine just stared at me. I gave her a shake, and she blinked, pulled herself together. “Yes, she does...in fact, she’s got about six infected cages in the isolation room right now. Gina mentioned we’d have to be careful working around her.”

“Excellent,” I said. “Come on, we don’t have much time. Do you want me to find her?”

Chris got up too, flicking her cigarette onto the pavement in a shower of sparks. “No, she usually makes an appearance upstairs directly after morning coffee. I’d better head her off before she reports those mice as ill.”

I reckoned that Maria was clever enough to work it out and that we could rely on her to be discreet, but Christine was already sprinting across the street. There’d been no chance to tell her about Rouyle, either, or the mystery protein.

It was clearly going to have to wait.



I sat across from Ainikka in one of the private study rooms in the library. She rummaged through a pile of papers until she found Rouyle’s article, now covered with illegible marginalia as well as beer stains.

“I managed it in just under two hours,” she said. “I don’t know if it’s the author or the person who translated it into Latvian, but it was fairly tortuous.”

I kept my suspicions to myself. “How should we do this, then?”

“Why don’t you read a complete transcript of the abstract, and then we can go through each of the results one by one?”

She took a piece of A4 from a file folder and slid it across to me.

Dominant passivity factors and pliancy criteria in rhesus macaques exposed to the PAX fraction.

Rouyle, R, Viknar, PM, and Maaros, E.

The neurobiochemical mechanisms underlying basic emotions and behaviours in higher primates are still poorly understood. In this study, we attempted to determine the factors involved in one fundamental characteristic: passivity or submission in the face of a dominant authority, even when such behaviour is clearly detrimental to survival. We noticed one male rhesus macaque in our colony that repeatedly demonstrated highly exaggerated submission behaviour, and that this feature was passed on to all offspring, even those never exposed to their sire, suggesting heredity over learned behaviour. We fractionated the brain of one male offspring and purified an active fraction, called PAX (for passivity activating extract), which, when injected intracerebrally into normal adult animals, transiently caused the same exaggerated submission. Moreover, these animals were highly obedient and suggestible using a variety of behavioural tests, even in the presence of

painful stimuli. This obedience in disregard for well-being in the presence of PAX suggests that the extract contains a novel, unique neurotransmitter or other biological agent that controls submission or passivity in a dominant fashion.

I stared at the sheet of paper, trying to keep a normal expression on my face. Inside, my stomach was still in free-fall.

“This isn’t the type of study I was led to believe was in the article,” I finally said, so steeped in auto-pilot deception at this point that the next lie emerged almost effortlessly. “A colleague told me there might be something about a certain signal transduction pathway in the nervous system that I could use to scoop my competitors.”

“Well, there might be something useful later on,” she said doubtfully. “Shall we continue?”

She took me through each of the figures and the accompanying interpretations. Except for the biochemistry experiment describing the original fractionation, most of the data consisted of electrical measurements of the test animals, which had been wired up to electrodes while being put through their often painful paces—a disturbingly gruesome affair.

“Their methodology seems unethical to me,” she remarked. “But animal regulations were more lax back then, I suppose.”

Not necessarily, I thought, remembering what Raim had told me about the rejection of Rouyle’s primate research application.

“I want to read you something from the final part of the Discussion section,” she said. “I know it isn’t relevant to your research, but you’ve got to hear this!” She held up a finger. “*Further studies with this fraction may lead to promising new methods for controlling troublesome human elements, such as criminals or psychiatric patients. Moreover, mass administration of the PAX fraction could be highly effective for instilling harmony and stability into highly volatile regions of the world, ultimately resulting in increased productivity and economic and social improvements.*”

She paused. “So far, so good...well, it’s a bit wild, but still within the standard exaggerated Discussion style people use to convince people that the work is worth funding. Agreed?”

I nodded, speechless.

Ainikka tapped a scarlet fingernail on the next block of text. “But then the author goes on: *Our research supports the notion that all*

human behaviours are controlled by simple molecules; if passivity can be transferred experimentally, then so might aggression, love, hate, fear and the like. This hypothesis could be tested by isolating as many of these substances as possible and introducing them into humans under controlled circumstances.” She met my eye. “It’s one of the strangest proposals I’ve ever read in a paper—my boyfriend couldn’t believe it either.”

I swallowed down a lump of nausea. “Yes, well...I’m afraid this has all been for nothing.”

“Sorry you’ve wasted your money.”

Duly reminded, I reached for my wallet.

“You can keep my notes on the article in case you have any more ideas.” She flipped platinum hair out of her eyes and stood up. “Are you coming?”

I gathered up all the papers. “I think I’ll go over it one last time to make sure I haven’t missed anything.”

As soon as she shut the door, I read the abstract again. Everything was coming together, and the picture was shaping up to be very ugly indeed.



From: glkraymer@geniaxis.com
To: a.ohara@rcc.cmb.ac.uk
Subject: understood

Andy,

I’ve got literally two minutes to write this e-mail. I only just got into work, after stopping home to change clothes – there was a serious accident on the M4 and we were severely delayed. Thank you so much for the CD...you were right, those songs were very disturbing, best savored on one’s own. I wasn’t sure at the time, but having thought about it, I suspect that R. might benefit from a discussion about the meanings behind the lyrics. As soon as I get a private moment today, I’ll talk to him about it. It might be possible to clear up any misunderstandings about your interpretations.

There’s a phone message from Christine, wanting me upstairs, but it’s impossible now because I’m in a last-minute conference all day with R., the boss, and some people from out of town. Could you convey my apologies?

That also means I can't speak to you either during the day, but I'm fairly sure I can get away briefly tonight. I'll come up to your lab around ten, after the evening session breaks up.

Can't wait to see you.

Gina

The message had arrived while I'd been upstairs with Ainikka. Right now, Gina was probably sitting around a conference table, listening to plans being made about a virus that she now knew contained something completely other than what she'd intended.

What was going through her mind? Perhaps she was being cautious because she didn't know exactly who was in on the secret. On the other hand, her e-mail implied she thought there might be a perfectly reasonable explanation for the mystery protein. Maybe she feared she'd taken the wrong tubes from Germany by mistake. She now knew that FRIP's antiviral activity didn't work in the brain, but naturally she'd want to confront Rouyle about it privately so he could save face if it were a stupid error. She'd spared his dignity before, at his seminar, when he was a complete stranger; surely now, as a lover, he would receive even more careful treatment. It was this very discretion, on top of her naïvety, that was going to land her in serious trouble.

Shit, shit, shit. I felt completely helpless. Thanks to my CD, she was going to confront Rouyle without hearing about his exploits in Estonia, the PAX fraction or the sick mice. I certainly didn't share her optimism about how he would react. In the best case, he'd just laugh at her worries and attempt to explain away all the evidence. She was probably susceptible enough to his charms to believe him, as she had already demonstrated a marked immunity to other duplicities. But in the worst case, he'd see her as a serious obstacle in his plan. Why hadn't I gone to her after I'd spoken to Raim? Why had I dropped off that CD instead of waiting until we could speak in person? I had completely miscalculated, and now it had all backfired explosively. I couldn't very well go downstairs and barge in on her meeting. Instead, I was forced to wait until the evening, an incomprehensible amount of time.

The text message alert on my mobile phone beeped me out of my preoccupation:

Got a few things to sort, then meet me at El Cid, 12? So far so good. xC.

I fretted through the next twenty minutes, then stood up and announced that I was going out for lunch.

Magritte beamed at me, obviously encouraged by such signs of normal, non-workaholic behaviour. Maybe she thought I'd sorted things out with Gina.

"We won't wait up!" Paul said with a ludicrous wink, probably favouring the Maria hypothesis.

The wind was still gusting, stirring up leaves and bits of litter into tiny localized vortices that dispersed almost as soon as they formed. Clouds scuttled across the sky in a shifty backdrop. For a brief moment, I felt a surge of vertigo, paused, then carried on.

Christine was already seated when I arrived.

"Tell me," I said, anonymous café chatter roaring in my ears. I bit into my sandwich more because it was in front of me than from hunger.

She nodded at me across the table. "It's sorted. Gina never turned up or responded to my phone message, so Maria and I had to make an executive decision." She sounded defensive.

"She couldn't get away—she was really sorry."

"She'd better have been." The pleasantness of her tone didn't entirely mask the chill underneath.

"Anyway, what executive decision?"

She dug into her BLT, obviously not suffering from a similar lack of appetite. "We sacrificed them," she mumbled around her mouthful.

"You didn't!"

"There was no choice, Andy." She glowered at me. "We had to get rid of the mice and then swap in new cages before Theresa showed up. We were bloody lucky there were extra litters still available."

"But those mice represented important evidence for Gina's attempts to get this Phase I cancelled!"

Her face was set. "They also represented the end of my promising career as a group leader in Newcastle—or anywhere else, for that matter—if we were discovered. And I'm not stupid—I *know* she needs the evidence. We did a very thorough observation on a few of the subjects, took videos, blood samples, even saved one corpse in the freezer in case anyone needs to prove later what virus went in."

She paused to swallow, took another bite. "By the way, there was no difference in the response of the normal SCIDs versus the

SCID/pbls—the presence of a human immune system obviously did bugger-all one way or the other.” She looked at me carefully. “But you already knew that, didn’t you? You said you had urgent news about the *in vitro* trial, so it wasn’t likely to have been good.”

“It’s not surprising,” I confirmed. “I’ll fill you in in a second. Just...how were the mice acting? Did you perform a necropsy to see what was wrong?”

She took a swig of Coke, a funny expression on her face. “There was nothing *physically* wrong with them, inside or out. They were just in some sort of stupor—dull eyes, not even reacting to being handled. I’ve worked with mice for years and these weren’t acting any way I recognized. It must be a freak cross-reaction between FRIP and Gina’s Verase gene, right?”

“Chris,” I said. “There’s been some information I’ve been keeping back.”

She put down her Coke slowly. “Why do I suddenly have a very bad feeling?”

“I just thought things were too premature or unlikely to be worth mentioning before, that —”

“Out with it, O’Hara.” Now her stare was positively steely.

It was then that I saw things from her perspective for the first time. How could I possibly justify having kept her uninformed for so long? She’d risked her career mainly because of our friendship, and I’d led her along like everyone else.

I began to explain, haltingly at first, gathering momentum as I went on. I didn’t have to worry about any outbursts, because soon she was completely hooked on the story. I started at the beginning, with Dan’s recollection and then Raim’s anecdote about the Estonian affair. When I mentioned Rouyle sleeping with the animal caretaker to further his primate trials, Chris stared at me with widening eyes.

Next, I passed her Ainikka’s translation of Rouyle’s abstract and showed her the ominous-sounding sentence about mass administration of the PAX fraction. Christine frowned as she read but refrained from any commentary.

“But after he switched fields at Pfeiffer-deVries and started working on FRIP, he obviously didn’t forget about PAX,” I theorized. “He must have identified the PAX gene on the sly, because there’s nothing published on it.”

“You’re way ahead of me here,” she said, irritated. “Tell me what happened next—in *order*.”

So I told her about my experiments with Helmut proving that FRIP was useless as an antiviral messenger in the brain, and Magritte’s reminder that Vera Fever Virus wouldn’t have been able to stimulate FRIP anyway.

“But none of this mattered in the end except to suggest that Rouyle was a fraud,” I said. “Because when Gina went to Germany to create the combination virus, I think he gave her the PAX gene instead of the FRIP.” I explained how Gina had stolen reagents from Rouyle’s lab, and about the experiment which had led me to conclude that Gina had been tricked into inserting a small gene of unknown origin into her herpes vaccine.

“I don’t have definitive proof, but I’ll bet you any money you like that it’s PAX.”

“It might explain the mice’s reaction,” Christine said thoughtfully. “I mean, what does a submissive mouse look like? Or maybe this primate neurotransmitter is a lot less subtle in a rodent brain.”

We both lapsed into silence, fiddling with the remains of our crusts, and eventually she raised her head, examined me with a neutral expression. “So I take it you’ve not told Gina any of this either?”

I squirmed in my seat. “It was a tricky situation, with them sleeping together. I didn’t tell her when I was first suspicious because I had no proof. By the time I got the result about the mystery protein, she was already in Cornwall, and I only got the article translated this morning.” My guilt wasn’t even remotely relieved by Christine’s slow nod. “Anyway, I left a message about the mystery protein at her flat over the weekend.”

“How on earth is she going to deal with it?”

“It sounds as if she’s going to confront Rouyle in private.”

“And she doesn’t have enough information to realize what a bad idea that is,” she said grimly. “If you’re right that Rouyle’s been hung up on PAX his entire career, maybe he’s come up with this scheme to test it in humans when the normal scientific channels failed.”

“That’s exactly what I was thinking.”

“After waiting so long, he’s probably not going to tolerate any unforeseen obstructions.”

“Are you saying Gina’s in danger?”

She paused. “Well, it’s a possibility. We’ve got to get her away from Rouyle—maybe she can stay at your place tonight. And then tomorrow we can go to Geniaxis and show them all the evidence.”

“Not the mouse trial, though!”

“Of course not. Your information should be convincing enough.”

I remembered something. “Are you sure that Boyd isn’t...?”

She blinked. “I guess I’m not. Well, first we make sure Gina’s safe, and then we can decide what to do.”

“She arranged to meet me tonight.”

“So you just spirit her away. Romantic, isn’t it?”

Beneath her careful humour, I could tell that she was still hurt that I hadn’t trusted her with the full story. But this concern was nothing next to my fear. The taste of dread kept coming back no matter how hard I tried to swallow it.



The afternoon passed in an unknowing blur. Somehow, I managed to speak intelligibly to my colleagues and put on a convincing impression of normality. I bantered with Marcy, who was irate that my stacks of plates were taking up too much space in the incubators. I fended off Paul, who kept trying to extract more details about my date with Maria. I managed to reassure Magritte, who’d approached me in a private moment to make sure that I wasn’t trying to do too much because of her comments on Saturday. And I performed an absolute marathon transfection session in the tissue culture suite, introducing DNA after DNA into the hundred or so plates I’d seeded the day before. I did all this in a daze, relying on years of practice to coast through the intervening hours until I could finally see Gina again.



It was just past ten and I was alone in the lab, tensed at my desk in almost unbearable anticipation. Gina’s window remained dark, but there was another square, lit behind blinds a few rooms over that I supposed was the Geniaxis conference room. I stood up, paced the lab without purpose, and when I returned, Gina’s lab had flooded bluish-white, and the conference room was darkened. After a few moments, Gina

herself came into view, followed closely by another person. When he turned in profile, I saw that it was Rouyle.

Gina spoke, sketching frenetic gestures in the air. At first, Rouyle looked to be trying to calm her down, both palms held outward in exaggerated reasonableness. But when she persisted, he began to react with an equal measure of agitated body language. As their argument intensified, she stabbed the air with a finger to make some point, and then he loomed over her, responding in kind and gripping her by both shoulders.

I stood up involuntarily, poised to run, but found myself transfixed. Gina's mouth worked in what looked like passionate anger as she struggled to free herself. She wrenched away, her hair fanning outward in response, but he made a successful swipe for her arm and began pulling her towards the door. She tried to escape his grip, but he muscled her from view with apparent ease.

The light was snuffed out, restoring the matrix of windows to dark uniformity.



I snapped out of my paralysis and pelted down the corridor, past shadowy empty labs on my left and right. I threw myself into the stairwell and hurtled down the steps, stumbling one step above the first landing in the sickly-green glow of the emergency exit sign. I grabbed at the railing, but it was too late: I was already going down, sprawling heavily onto the floor.

My body slid to a complete stop, all the air kicked from my lungs. After a few shocked seconds, a hot pain bloomed in my right knee. I levered myself up and limped as fast as I could down the rest of the stairs, but my knee refused to take any weight. Just as I was pushing through the fire doors, one set of lifts opposite the Geniaxis main entrance swished closed. The company was clearly darkened and lifeless.

I wavered in agonizing indecision by the stairwell. Rouyle must have overpowered her and forced her into the lift. According to the illuminated display above the doors, it was already sinking past the third floor. I didn't think I could negotiate that many flights quickly enough even without an injury, so I hobbled over to the lifts and hit the button.

While I was waiting for the second lift, I crossed the corridor and leaned on the Geniaxis after-hours bell for a few seconds, just to be sure, listening to its fruitless summons through the thick glass. When I turned around, the display showed that the current occupants of the other lift had arrived in the Centre lobby. The porter went off-duty at eight, and the area around the building was deserted at night, so in all likelihood, there would be no one to detain them. An important visitor like Rouyle would probably have a hire car parked in one of the VIP spaces in the car park.

The second lift arrived at last, and I dived in. When I erupted out again, the lobby was empty, and outside, the automatic gate of the Centre's car park was just closing with the crashing finality of iron on cement. Ahead, there wasn't another living creature in any direction, not on the pavements, not on the street, not in the quadrangle park. Just the distant tail lights of one lone car, turning the corner at dangerous speed. When I blinked the sweat from my eyes, it was already gone.