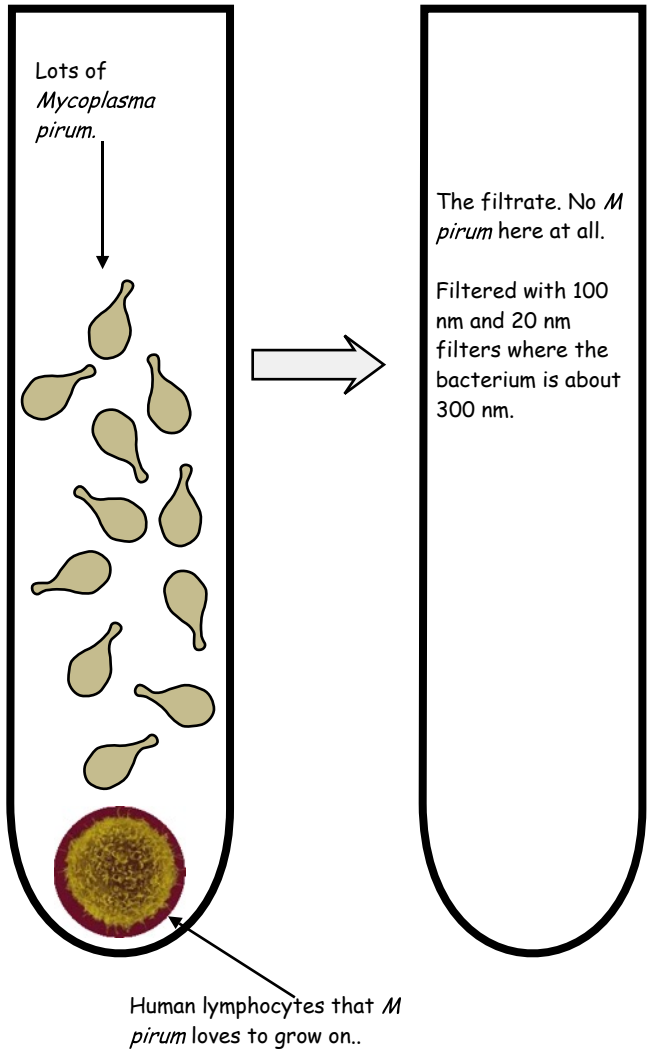
Trying to understand the Luc Montagnier Papers of 2009-10

Bob Krieckhaus

Luc Montagnier says it was in the year 2000 when he was attempting to separate a very small bacterium from HIV particles, both growing and prospering on lymphocytes in his laboratory, that he first encountered the strange phenomena that he and his colleagues elucidate in papers published in 2009 and 2010. This paper of my own is intended to clarify for myself and any interested parties the substance of those papers, which has recently been the subject of significant interest, notoriety and even scorn (viz). {1.0}

At some point in that separation process, Montagnier says, "Starting with pure cultures of the bacterium on lymphocytes, the filtrates were indeed sterile for the bacterium when cultured on a rich cellular medium, SP4. Polymerase chain reaction (PCR) and nested PCR, based on primers derived from a gene of *M. pirum* which had been previously cloned and sequenced, adhesin, were negative in the filtrate" (DNA Waves p 2).{1.1}

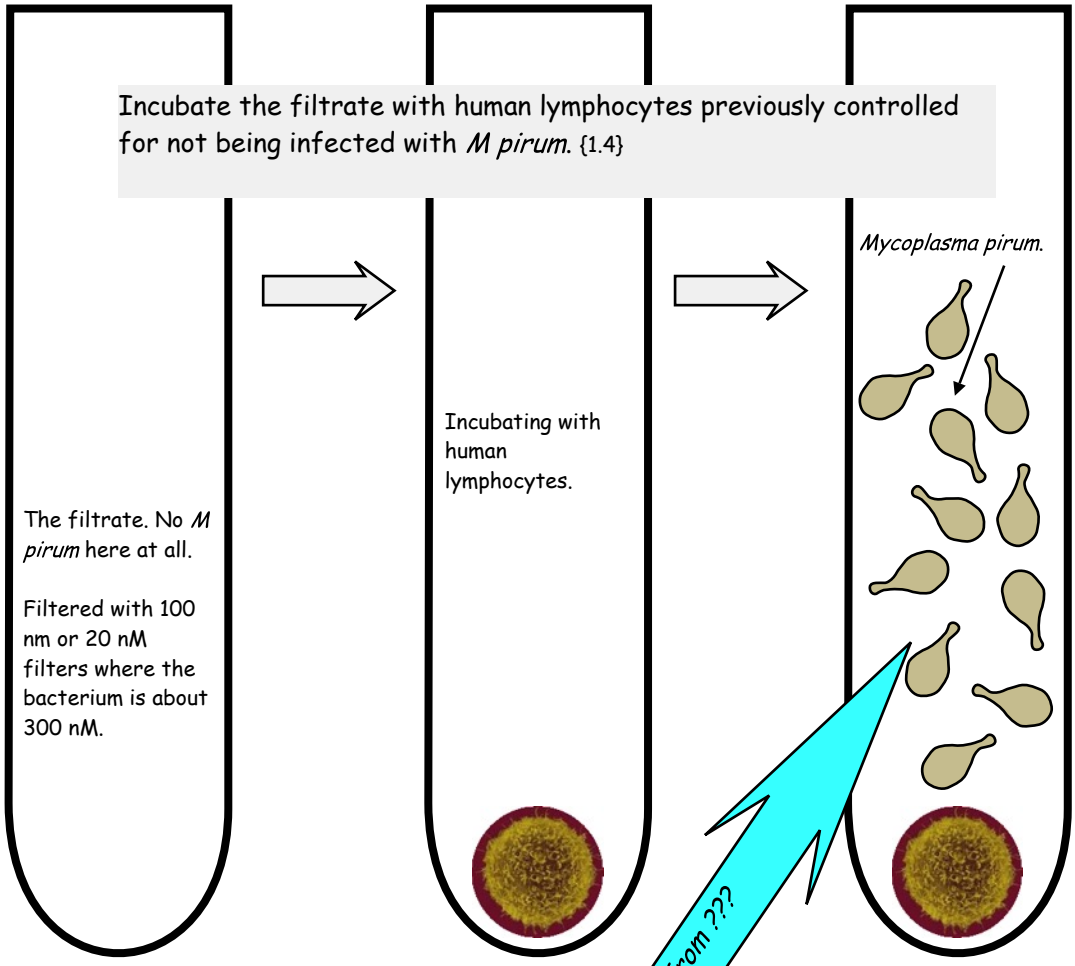


Culturing the filtrate on SP4 >>> nothing. Running PCR and nested PCR >>> nothing either.

(And the PCR technique Googles out as about as good as it gets right now at finding tiny amounts of stuff. Dr. Montagnier received the Nobel Prize in medicine for isolating the HIV virus, which is even smaller than the tiny *M prium*, so I've got to think we can trust him on this.) {1.2}

(Continuing from the earlier quote.)

"However, when the filtrate was incubated with human lymphocytes, (previously controlled for not being infected with the mycoplasma) the mycoplasma with all its characteristics was regularly recovered ! Then the question was raised: what kind of information was transmitted in the aqueous filtrate? It was the beginning of a long lasting investigation bearing on the physical properties of DNA."

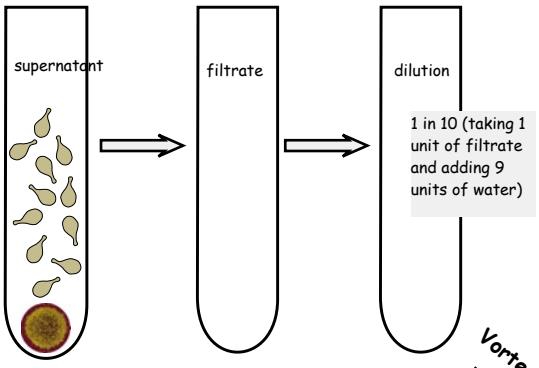


This also pictures what is stated in science talk in EMF Signals: "Thus, filtration of a culture supernatant of human lymphocytes infected with *Mycoplasma pirum*, a microorganism of about 300 nM in size, through filters of 100 nM or 20 nM porosities, yielded apparently sterile fluid. The latter however was able to regenerate the original *mycoplasma* when incubated with a *mycoplasma* negative culture of human lymphocytes within 2 to 3 weeks." {1.5}

Looking for answers to that question led these scientists to discover some very strange properties of the filtrate that appeared to be absolutely void of any of the *mycoplasma pirum*. {1.6}

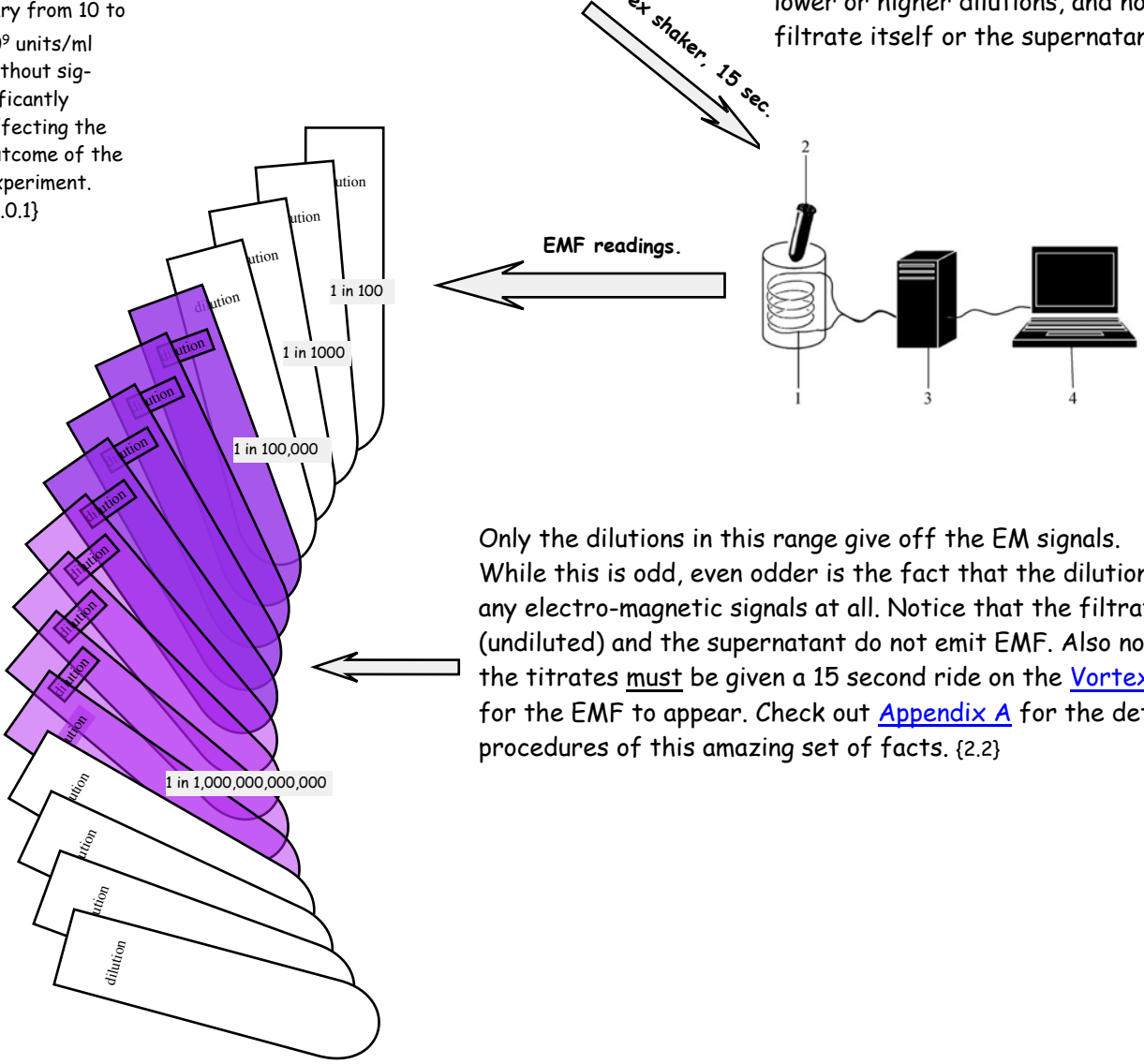
The sterile filtrate made from the *M pirum* supernatant was then progressively or serially diluted with medical grade sterile water. That made a series of dilutions of known concentrations growing ever more dilute. "Generally 15-20 decimal dilutions [max]," they state. So those would range from 10^{-1} to 10^{-20} in dilution strength.

Notice: first the supernatant with strong growth of *M pirum*, then the filtrate with no *M pirum* at all, then 15 to 20 or more dilutions in water of that already sterile filtrate. {2.0}



The density of bacteria in the supernatant can vary from 10 to 10^9 units/ml without significantly affecting the outcome of the experiment. {2.0.1}

Now here is the strange part. When the team places test tubes of the 15 to 20 dilutions of the filtrate of the supernatant inside the coil of an apparatus for measuring electromagnetic fields (see their diagram below), the coil detects very low frequency signals from some of the dilutions, but not others. Usually the signals came from the dilutions at 10^{-5} to 10^{-8} or 10^{-12}, but not at lower or higher dilutions, and not from the filtrate itself or the supernatant. {2.1}



Only the dilutions in this range give off the EM signals.
While this is odd, even odder is the fact that the dilutions give off any electro-magnetic signals at all. Notice that the filtrate (undiluted) and the supernatant do not emit EMF. Also note that the titrates must be given a 15 second ride on the Vortex shaker for the EMF to appear. Check out Appendix A for the detailed procedures of this amazing set of facts. {2.2}

How to interpret all this?
1. Water completely filtered of *M pirum* nevertheless grows same on sterile lymphocytes.
2. That same filtrate, when diluted and shaken vigorously, produces EMS – but only at certain high dilutions, only when shaken, and not as the filtrate without dilution or as the precedent supernatant. {3.1}

Perhaps supposing that there remains in the filtrate some nanostructure of *M pirum* that effects both the growth of *M pirum* on T cells in the filtrate and the production of EMF signals at the several dilutions, Montagnier and company proceed with a number of further tests on that assumption. These also yield fascinating results, including the much-mocked DNA teleportation. For the moment, though, I want to think about just these first results. {3.2}

To take the first strange result, that the filtrate develops into *M pirum* when cultured over lymphocytes – Montagnier suggests no mechanism by which to account for this. But the theory of morphic resonance does suggest possibilities if one supposes the nanostructures involved to include something on the order of an embryo or fertilized egg (*mutatis mutandis* for a simple bacterium). Then this beginning actor, whatever it might be, finds itself in an arena strong with the morphic resonance of *M pirum* and follows the creodes of those fields in the nurturing presence of the lymphocytes. {3.3}

All that hypothesizing is evidently rather vague and hopeful, but do notice that it can be tested. For on this hypothesis, if the 20 nM first filtrate were taken to a lab (which need not be far away) where a similar density of a different species of *Mycoplasma* was in close proximity, then one might expect to see the development of *M pirum* slowed or even to see the other species develop in the culture of lymphocytes. Failure to get this effect would not disprove the hypothesis, but obtaining it would tend to confirm it. {3.4}

The need to have controls in the experiment (culturing lymphocytes in water known to be pure and not ever having had *M pirum* in it) also arises in my mind from the Sheldrake theories. The rat learning experiments of McDougall at Harvard were challenged for a very similar omission of control rats, and when the controls were used the results were quite counter expectation and confirmatory of the theory of morphic resonance or causation. (fn1) {3.5}

I also realize that there exists a significant-seeming parallel to the investigations of embryo regulation conducted by Hans Driesch. The removal of parts of the developing embryo, the destruction of part of it, sounds to me like a parallel to the Vortex shaking of the filtrate dilutions – on the assumption that whatever is there that is able to grow into *M pirum* (without dilution – see §1.4) is like the developing embryo. Then shaking the dilutions of that filtrate would correspond to damaging the embryo, which nevertheless continues to develop into something very much like what the non-damaged ones do. (But see further thoughts.) Sheldrake supposes the resonance of morphic fields facilitates the regulation of the damaged embryo, and I am supposing some similar resonance to operate on the damaged nanostructures posited by Montagnier et al. {3.6}

But the Sheldrake theory has the damaged embryo growing into a near-perfect one, not emitting EMS. Where did they ever even get the idea of looking for EMS! {3.7} (See expansion note in Appendex.)

And why EMS only at certain way high dilutions (thus the thinking about homeopathy)? I also note that it would make sense to test the dilutions for their ability to induce growth of *M pirum* in human lymphocytes. They have not done that. It might turn out that all the dilutions up to the beginning of EMS emission do yield *M pirum* over lymphocytes. Then the EMS would appear as some sign of inadequacy to the dilution of nanostructures they are supposing to be causal in all this. A consequence of there not being enough, but something left to, as it were, call for help. {3.8}

The idea that the noble property of the diluted water lies in the as yet not too high dilutions is also consistent with the strange teleportation experiments – there might be some EMF activity going on that their primitive EMS capture device has not noticed. The teleportation ability would derive from that activity in some way – and that would be the productive Why of the loss of EMS production by the neighboring testubes inside the EMF protective shields – they have been improved, not damaged! {3.9}

We jump to the next page for detailed consideration of the second strange results that I have been anticipating here, the appearance of EMS-generating entities only in a limited range of high dilutions of the filtrate, and only after shaking in the Vortex apparatus.

After determining that the apparently sterile filtrate from the supernatant of *M pirum* will in fact somehow grow more *M pirum* on human lymphocytes, the experimenters turn their attention to the property of the filtrates to produce EMF waves of very low frequency. {4.1}

It is rather surprising to me that they would do such a thing – no doubt they had some clues to the existence of this property from earlier experiments they do not mention. More commonsensical, to me, would have been to pursue the exact nature of what was causing this mysterious growth of *M pirum* on the lymphocytes. {4.2}

It is also odd that while they test these dilutions for production of EMS, they do not test them for the production of *M pirum* on the lymphocytes. I do wish we had that information, as I suppose it might help to interpret the very strange EMS results. But we do not. {4.3}

I have summarized their findings elsewhere in this paper (here and here). They are indeed strange: the EMS come only in certain very high dilutions, but not beyond a certain point; it is necessary to shake the dilutions well before they will produce the EMS; neither the decanted supernatant nor the undiluted filtrate yields EMS; it is necessary to have some VLF background noise, and shielding the test tubes from the noise cancels the effect. {4.4}

The scientists then put the first filtrate through some tests to determine size and density of the nanostructures that appear to be producing the EMF signals. When the size-determined fractions resulting from this testing were further tested for producing EMS, only certain ones were positive. Again, I don't see why they didn't also test the fractions for their ability in dilution to produce *M pirum* on lymphocytes. {4.5}

E coli

Montagnier and company now treat with *E coli* as they have with *M pirum*. The results are quite similar except that 1) the filtration kept the active factor out at 20nM, suggesting it was sized between there and 100nM 2) although they found the filtrate sterile when plated on nutrient agar medium, they did not test it on lymphocytes as was done for *M pirum*, nor did they appear to make any other efforts to see if the filtrate had similarly surprising growth properties. {4.6}

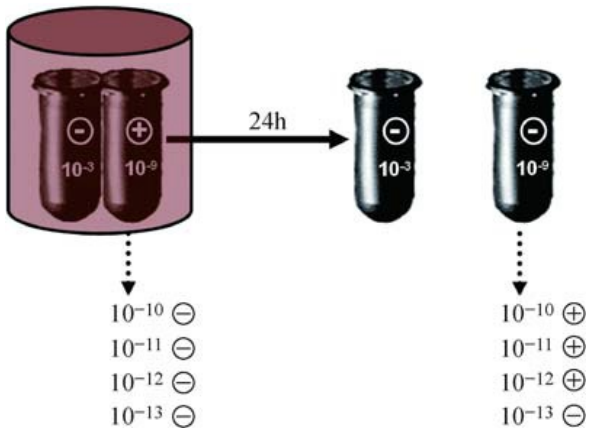
Wondering why lower dilutions were silent for EMS, the experimenters tried adding a negative low dilution to a positive high dilution and saw that the high became silent. They wonder if the cause might be self-canceling interference of the EMS with denser dilutions or the production of an inhibitory gel at the denser dilutions. {4.7}

This appears to have suggested that they try what they call "homologous 'cross talk' between dilutions. They wondered if they could "generate new signal-emitting structures from tube to tube by using wave transfer." To test this, they placed a low-dilution silent test tube alongside a higher-dilution active one, both protected from outside EMF by special shielding, for 24 hours. Very surprisingly, the silent tube made the loud one silent under these conditions. {4.8}

Furthermore, subsequent dilution of the now silent tube made it noisy, to "suggest that the receiver tube was made silent by formation of an excess of new nanostructures, which could emit signals upon further dilution." {4.9}

Additionally, it was found that placing a shielding sheet between the two tubes during the 24-hour incubation by proximity period yielded negative results. {4.10}

See graphic for clarification.



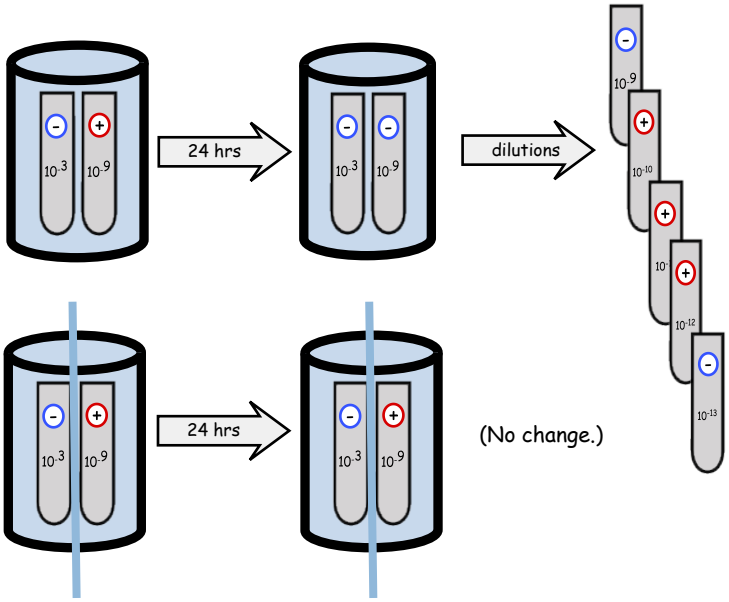
Left is figure six from EMF Signals. On the left, we see the two test tubes, one negative for EMS at 10^{-3}, the other positive at 10^{-9}. The data pointed to below refer to the fact that diluting the positive with the negative yields still negative dilutions. (Those dilutions would be positive if they had been achieved with pure water.) {4.11}

On the right we see the result of letting the tubes sit side by side for 24 hours in an EMF-protective shield. Afterwards, the formerly positive test tube is negative, but, as seen on the right, becomes positive when diluted as indicated in the data pointed to below. {4.12}

Here is another graphic representing the tests performed on the dilutions of various filtrates of *E coli*. The accident of the terms negative and positive for showing EMS does not necessarily indicate that some structure has been added to the contents of the negative test tubes. This is because while the positive tubes do show a certain identified EMF signal structure that is not found in the negative tubes, it has not at all been established that some other pattern of EMS does not exist in the negative tubes. {5.1}

Since the action of the blue on the red tube in the shielded housing is prevented by placing a shielding sheet between them, it would appear that the blue tubes are affecting the red ones by means of some field action, presumably electromagnetic, but that has yet to be established. {5.2}

Also to be noted is that the negative dilution that eventually appears on the far right of the procedures is not to be taken as identical to the negative dilution that begins that series. In fact, I regret that no positive testing on the early dilutions of the filtrate, or on the filtrate, have been performed to see if the transformation to EMS emitting state marks the loss of some agency. In the case of *M pirum*, the filtrate was shown to be able to induce growth of the bacterium on human lymphocytes shown to be sterile for that. However, in that case also, the dilutions were not tested for a similar power. {5.3}



Other bacteria were tested for this EMS-emitting property and tested positive in the same manner with the same dilutions and original filtration

- *Streptococcus B*
- *Staphylococcus aureus*
- *Pseudomonas aeroginosa*
- *Proteus mirabilis*
- *Bacillus subtilis*
- *Salmonella*
- *Clostridium perfringens*.

The blue to red transfer effect did not occur between different species. The authors write, "These results indicate that the transfer effect is mediated by species-specific signals, the frequencies of which remain to be analyzed." {5.4}

A non-exhaustive study shows that "most of bacteria pathogenic for humans" show this EMS effect. Probiotics, by contrast, do not. {5.5}

<u>What stops the EMS?</u>

RNAseA – no
Dnase I – no
Lysozyme – no
Proteinase K – no
Formamide 10% – no
Lithium cations – reduced intensity, not range

Heating at 70°C for 30 min – yes
Freezing at -20/60°C for 1 hr – yes

<u>The link with DNA</u>

Because the investigators had found that "a pretreatment of a suspension of *E coli* by 1% formaldehyde did not alter its capacity to induce the electromagnetic signals, while killing the bacteria," and because they knew that "this treatment alters the surface proteins of the bacterial cells without attacking their genetic material," they began to study the workings of the bacterium's DNA in these experiments.

This is from EMF Signals. I will comment on the paragraphs to help my grasp of things

Indeed, DNA extracted from the bacterial suspension by the classical phenol: chloroform technique was able upon filtration and appropriate dilutions in water to emit EMS similar to those produced by intact bacteria under the same conditions. DNAse treatment of the extracted DNA solution abolishes its capacity to emit signals, at the condition that the nanostructures previously induced by the DNA are destroyed. A typical experiment is described as follows:

They don't mention the shaking by Vortex procedure. Very frustrating.

I don't see from the next 2 paragraphs where they get the conclusion that the DNA is sending out EMS rather than the associated nanostrutures. Nor do their earlier experiment show that it is the intact bacteria that are emitting the EMS.

This definitely shows them removing the DNA from the original suspension they treated and "resuspending" it in Tris 10-2 M, pH 7.6 – I can't quickly discover what that is, but they evidently are assuming it is passive with regard to generating nanostructures of the sort they're studying.

Continuing, 1

E. Coli DNA was treated by Proteinase K in the presence of SDS (sodium dodecyl sulfate) and further deproteinized by phenol-chloroform mixture. The pellet obtained by ethanol precipitation was resuspended in Tris 10-2 M, pH 7,6 and an aliquot was diluted 1/100 in water. The dilution (10-2) was filtered first through a 450 nM filter and the resulting filtrate was then filtered again on a 100 nM filter. The filtrate was further diluted in serial decimal dilutions in water as previously described.

"As previously described" might be taken to include the Vortex shaking… And down in the next paragraph you would expect them to specify as to the critical nature of Vortex shaking (since it was critical in the non-DNA earlier studies). So maybe no Vortex.

Continuing, 2

As for the intact microorganisms, the filtration step was found to be essential for detection of the EMS in the DNA dilutions. In its absence, no signals could be detected at any dilutions.

In contrast to the microorganism suspension, where the filtration was supposed to retain the intact cells, the filtration at 100 nM did not retain the DNA, which was still present in the filtrate, as measured by optical density. However, filtration with a 20 nM Whatman filter retained the nanostructures emitting the EMS, suggesting that they have the same range of sizes than those originating from intact bacteria.

They note that the DNA is different from the *M pirum* in not being kept out of the filtrate, but they distinguish the DNA from the nanostructures.

I am intrigued by the very fact of EMF signals emanating from the nanostructures – check out the apparent emanation of something in the snow around the trees up there. Linda Molten Howe says,

> *These mysterious snow circles in a grove of trees on Leckhampton Hill south of Cheltenham, Gloucestershire, England, were reported in the December 9, 2010, Gloucestershire Echo. Resident Freddie Holding was walking her dog and told the newspaper, "I couldn't believe it. I have never seen anything like it before." The Managing Director of the Cheltenham Tree Services, Adrian Phillips, said, "There is no reason for any kind of fungus to affect the trees in the cold weather, and it seems unlikely things falling from the branches could create such a pattern. The most likely answer is that the pattern is manmade." But how? Image © 2010 by Freddie Holding, reprinted in the Gloucestershire Echo.* {source on 2-5-11}

To my mind the EMS found by Montagnier and co are as startling as those patterns around the trees. Instant skeptics say they must be man-made, but I don't believe they have given much thought to just how a man might do that. Perhaps they know something I don't, however.
Similarly, some scientists scoff at the Montagnier mysteries because they seem to parallel certain homeopathic ideas, and these same scientists are absolutely convinced that must be nonsense. But we've got a very legitimate, Nobel-Prize winning scientists here, and it's really hard to think of him and his colleagues as making this stuff up.

A suggestive speculation is that these apparent EMS may come, as may also be the case for the EMS in Montagnier's filtrates, from some deficiency in a condition that otherwise is not producing them. The waves may be an alarm signal.

Appendices

Appendix A

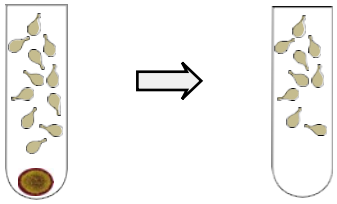
Detailed presentation of the procedures reported in
Interdiscip Sci Comput Life Sci (2009) 1: 81–90
DOI: 10.1007/s12539-009-0036-7
Electromagnetic Signals Are Produced by Aqueous Nanostructures Derived from Bacterial DNA Sequences

Luc MONTAGNIER[1],[2*], Jamal AÏSSA[1], Stéphane FERRIS[1], Jean-Luc MONTAGNIER[1], Claude LAVALLÉE[1]

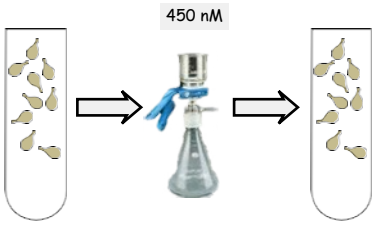
[1](Nanectis Biotechnologies, S.A. 98 rue Albert Calmette, F78350 Jouy en Josas, France)

[2](Vironix LLC, L. Montagnier 40 Central Park South, New York, NY 10019, USA)

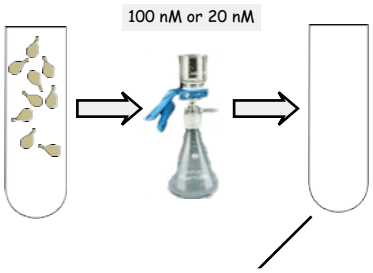
Water rich in a microorganism (or its DNA) is filtered to remove the stuff, then filtered and tested repeatedly to show it is quite empty of the thing. But when this filtrate is



Create titers of 10^6-10^7 infectious units/ml of *M pirum* taken from the supernatants of "a culture derived from the blood of an apparently healthy subject." Don't know why they bother to say that. They add that the human T lymphocyte cultures to which they added the blood had been pretested for lack of *M pirum* contamination. Perhaps that's how they know this mycoplasma came from that apparently healthy subject. {A.1}



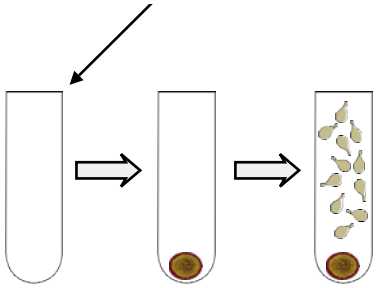
Filter out any debris in the titres with 450 nM Millipore filters. The *M pirum* itself is about 300 nM long. {A.2}



Filter out the *M pirum* now by running the 450 nM filtrates through 100 nM or 20 nM filters. Either way, confirm the absence of *M pirum* both by incubating the 100/20 nM filtrates for several weeks on SP4 medium and by running PCR and nested PCR tests on a known piece of the bacterium's DNA. It is sterile for *M pirum* and empty of anything larger than either 100 or 20 nM. Anything left would be a

From here, Montagnier et al. go two directions: 1) culturing the sterile fluid on human lymphocytes and discovering it does somehow still produce *M pirum* and 2) studying the fluid for other properties.

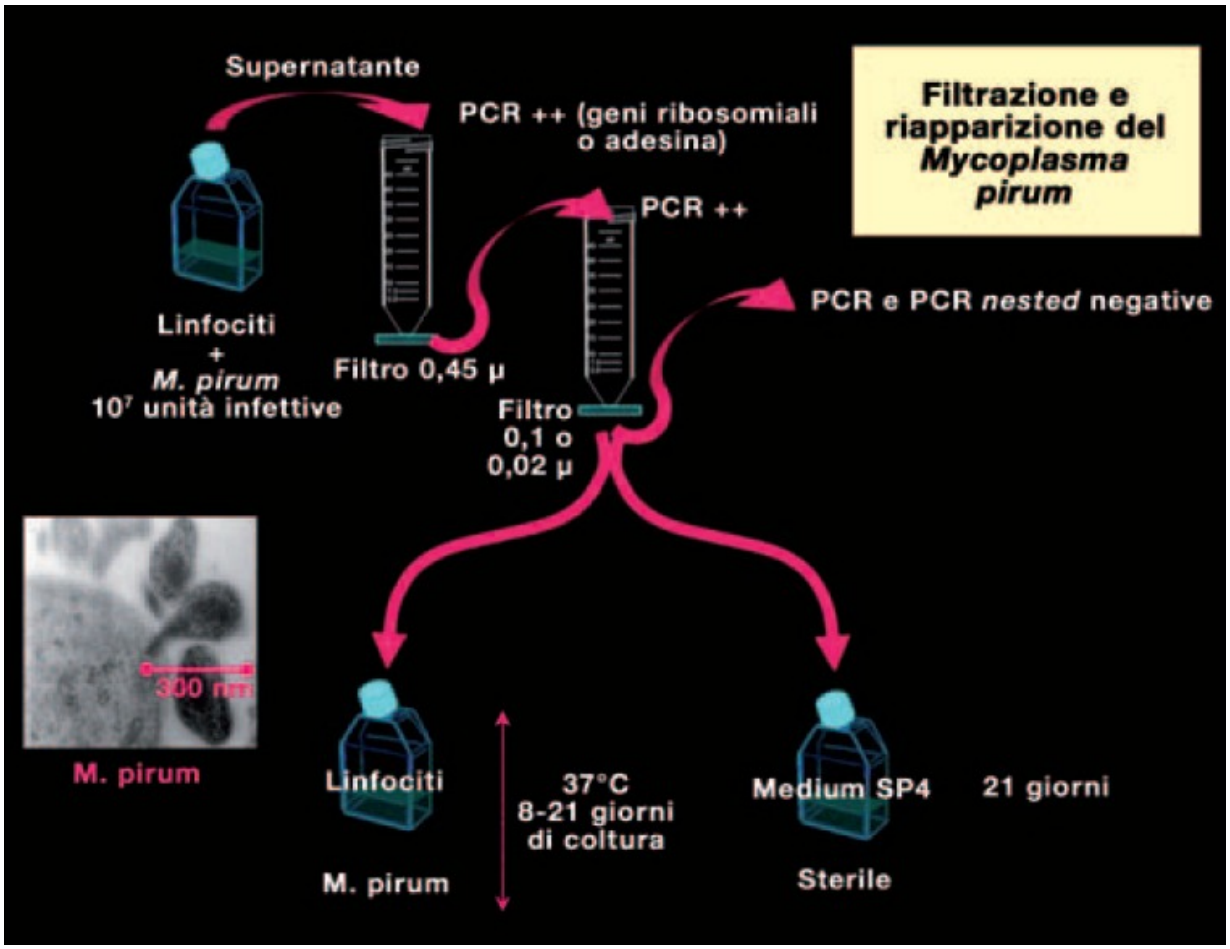
[1]



"However when the filtrates were incubated for two weeks (100 nM filtrate) or three weeks (20 nM filtrate) with a culture of human activated T lymphocytes, the mycoplasma was recovered in the medium with all its original characteristics as previously observed." This is the astonishing discovery featured above on page 2. Unstated in the above-quoted paragraph is that the lymphocytes were known to be completely free of *M pirum* in advance. In this paper (EMF signals) that condition is covered by an earlier statement that all cell cultures were first tested for lack of *M pirum* by PCR and nested PCR. See this note on their not controlling for water source. {A.5}

In a paper published in Italian, Montagnier provides a clear visual summary of this part of his experiments. The word "Linfociti" means lymphocytes.

[1]

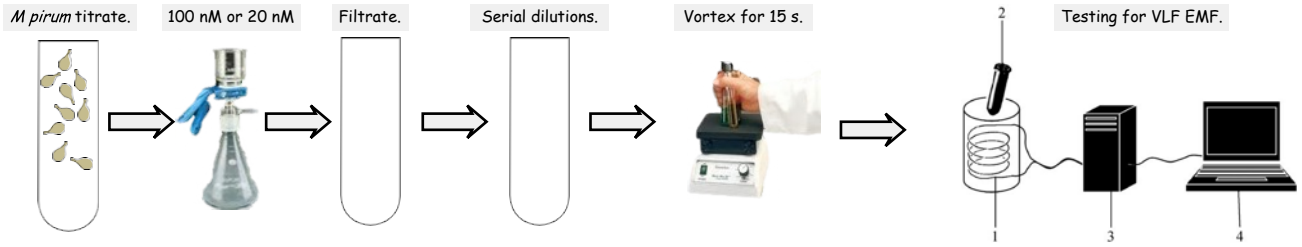


The three red arrows show that the filtrates at 100 nM and 20 nM produce a filtrate negative by PCR and nested PCR testing, also sterile when incubated for 21 days in SP4, that will nevertheless grow *M pirum* in 8 to 21 days of culturing on lymphocytes at 37 degrees Celsius. Unstated in the graphic is the fact that the lymphocytes at the end of this process have been pretested to be negative for *M pirum.* {A.6}

The main question raised by this incongruity (that the negative growth potential suddenly becomes quite positive when the medium contains sterile human lymphocytes) would ask just what agent might at work in this highly purified filtrate.

The next page follows Montagnier & company along the second branch of their investigation.

[2] Working now with the mysterious filtrate that has no discernable *M pirum* left in it but still appears to have the power to engender an infection of that bacterium in human lymphocyte cultures, the Montagnier team produce a series of 15 to 20 increasingly diluted samples in 1.5 mL plastic tubes. After diluting each new batch, they agitate the test tube in the Vortex apparatus vigorously for 15 seconds. After all the dilutions have been made, they shift to testing each batch for the property of emitting Very Low Frequency Electromagnetic Fields. Only certain of the dilutions are positive for EM signals, and only when they have received the Vortex shaking. Neither the titrate nor its filtrate is positive for EMF. {A.7}



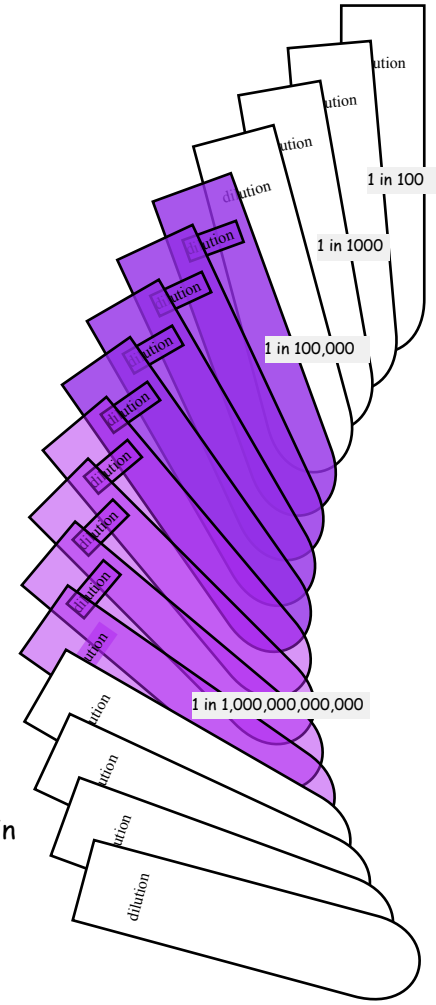
This will seem pedantic overkill to many, but notice that even a rather serious popular science magazine gets the reported facts wrong, and really quite seriously so:

> *Montagnier strained a solution of the bacterium Mycoplasma pirum through a filter with pores small enough to prevent the bacteria penetrating. The filtered water emitted the same frequency of electromagnetic signal as the bacteria themselves. He says he has evidence that many species of bacteria and many viruses give out the electromagnetic signals, as do some diseased human cells.* (New Scientist)

Neither the filtered water nor the bacteria themselves in solution emitted the EMF. The filtered water itself had to first be diluted and then shaken for 15 seconds to emit EMF, and even then, only certain dilutions showed this trait.

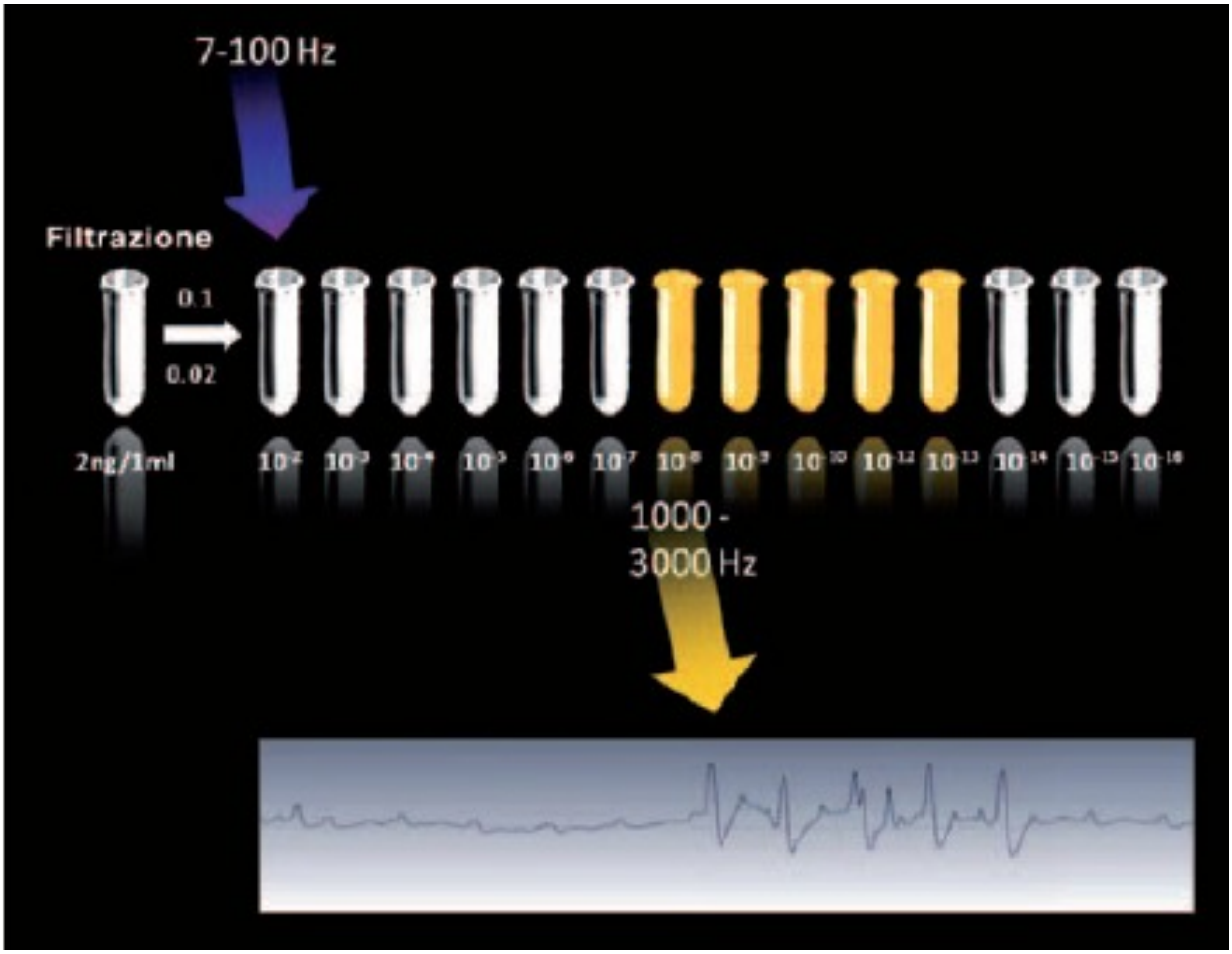
These differences make a huge difference in how a person even begins to understand or hypothesize about the facts of the experiment. It is easy enough to suppose that living bacteria in large numbers together might give off some EMF – the heart and the brain do this. Current must flow in bacteria. But if you take the bacteria away, where does the EMF come from? But wait – you don't just take them away, you dilute the seemingly empty water all the way up to 1 to 100,000 and only then does it give off EMF. But no, wait yet again – it has to be shaken first for 15 seconds for this to happen. And then after 7 or so more 1 to 10 dilutions of the 105

See §2.1 for a few more specifics on the EMF readings.



The positive EMF readings show spikes in intensity at a few frequencies in the VLF background noise of the lab. The scientists do not present tabular data for all their experiments, but state, "Positive signals were usually obtained at dilutions ranging from 10-5 to 10-8 or 10-12. Higher dilutions were again negative." (EMF Signals) They also state without tabulation, "The positive dilutions varied according to the type of filtration, the 20nM filtrate being generally positive at dilutions higher than those of the 100 nM filtrate." {A.9}

[2] In the same Italian paper mentioned above, Montagnier provides a second graphic that summarizes the material I have just presented:



The graph is quite dramatic. This second path leads to even stranger conclusions – the something that persists in the filtrate that is smaller than 20 nM and is not recognized by PCR testing as belonging to *M pirum* and will not grow into *M pirum* on SP4 medium in 21 days, but will nevertheless grow into *M pirum* on sterile lymphocytes in pure water – that something, already very strange, now appears to have the property of generating conspicuous electro-magnetic signals in the filtrate. Stranger still, the filtrate must be highly diluted before the EMS appear, and the property persists at yet more diluted levels, after which it finally disappears. But wait, we're not done yet with strangeness – the filtrate will not do its tricks unless it is agitated for about 15 seconds. And wait yet again – it matters almost not at all how densely populated with *M pirum* cells the supernatant is from which the filtrates are prepared. The initial titers can vary from 10^9 to just 10. On a final note, we observe that neither the supernatant nor the undiluted filtrate will show the EMS-producing property. You must remove essentially all the *M pirum* to get the effect, and the filtrate must be both highly diluted and shaken to show EMS.{A.10}

Appendices

Appendix B

Of course we don't know that we have the case of the embryos, which simply continue on developing to their term normally, in the early filtrates that do not produce the EMS. Somehow fixated on getting to the EMS production, Montagnier et al. don't seem to think about testing the early filtrates to see if they, too, will have that marvelous property of growing *M pirum* on sterile lymphocytes. These early guys, instead, come across feeling like failures, failures to produce EMS. But what if the production of EMS is more like a cry for help from dilutions that have lost some earlier ability that the team here is not looking for?

It might also be that shaking the dilution damages some of the nanostructures in such a way that they start producing EMS, or would absent the presence of enough as yet still undamaged structures, structures that might mask the EMS… The possibilities are very great. Too numerous. Too much speculation here.

Notes

Papers – I am using DNA waves and water (**DNA waves**) as well as Electromagnetic signals are produced by aqueous nanostructures derived from bacterial DNA sequences (**EMF signals**).

Scorn – "Scorn over claim of teleported DNA," New Scientist .

Supernatant is used, my Googling tells me, to name the fluid left in the upper part of the centrifuge test tube after giving it a whirl. In this case, they first create a mess of *M pirum* growing on human lymphocyte cells. Then they use the centrifuge to push the massive lymphocyte cells to the bottom so they can decant the supernatant and proceed to titrate it in the several concentrations they used for further experimentation.

Sterile water – In Electromagnetic signals, the authors state, "The first 2 dilutions (1/10 and 1/100) are done in serum-free RPMI medium, in order to avoid eventual protein precipitation in deionized water." If I get around to figuring out what that means, I'll add it in later. For now, I am taking it on faith that doing that does not detract from the strangeness of the results these workers obtain with their diluted filtrates. For the highly inquisitive, here is a link to an external explanation of RPMI medium. Notice on that page a further link to Serum Free Media.

The **Vortex shaker** appears to be a standard piece of lab gear.

> *Vortex mixers are quite commonplace in bioscience laboratories. In cell culture and microbiology laboratories they may be used to suspend cells. In a biochemical or analytical laboratory they may be used to mix the reagents of an assay or to mix an experimental sample and a dilutant.* (Wikipedia.)

***Pretested** this way: "All cell cultures were first tested for the lack of M. pirum contamination by polymerase chain reaction (PCR) and nested PCR, before starting the experiments" (EMF signals).*

PCR and nested PCR tests work by having a known piece of the target's DNA and letting a polymerase chain reaction work on the filtrate or whatever until enough polymer is built up to be detected. This is how they test for traces of evidence at crime scenes. Here is an authoritative source calling the nested PCR tests the gold standard for detection of microorganisms. Googling around quickly shows that these tests are the most accurate known today, and also expensive and time-consuming.

Note on controlling for water. It's interesting that they don't try culturing the lymphocytes in pure water from some other source, water that has never had any *M pirum* in it. Even though they do go to the trouble of running the PCR tests on the lymphocytes to be sure they're sterile or negative for *M pirum* , they don't control for water.

If they did, they would find out for sure whether it was something peculiar to their filtered water that was causing the strange results. For if the outside water also yielded an infection of *M pirum,* they would have to rethink their assumption that it was something in the water that was causing the growth of *M pirum* in their lymphocyte culture. And, contrawise, if the effect does not appear when they use outside water, they can feel comfortable in their assumption that it is indeed something left in the water after all that filtering that is causing the infection.

Naturally they think it would be a waste of resources to go that route because there is no possible way that mixing pure water and pure lymphocytes could produce a growth of *M pirum.* They are supposing a material cause to be necessary for a material effect to manifest. And they think that water and lymphocytes both sterile for *M pirum* lack any material agent that might be part of a causal nexus here. But I am thinking of the Sheldrake theory of morphic resonance. I may have that wrong, but it looks to me like IF there were some perhaps inchoate life-making process going on in or near the lymphocyte cells, some low-level, as yet scarcely formed growth process amongst the molecular mess down there, and if that process were also predisposed somehow to make bacteria or something else simple and cellular, then the presence of such a strong morphic field of *M pirum* in the neighborhood might be just what was inclining this already present (perhaps always present) growth process to take the *M pirum* chreode and slide on down into full-grown organismic life.

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ATTI DEL XXV CONGRESSO DI MEDICINA BIOLOGICA – NUOVI ORIZZONTI IN MEDICINA –

Milano, 14 e 15 Maggio 2010 - SESSIONE RICERCA - "IL DNA TRA FISICA E BIOLOGIA – ONDE ELETTROMAGNETICHE DAL DNA E ACQUA" (DNA BETWEEN PHYSICS AND BIOLOGY - MESSAGES FROM WATER,") L Montagnier (link).
Nanostructure – because whatever it is must pass through the 20nM filter.
Morphic Resonance – Sheldrake hypothesizes a new field, non-energetic like probability fields, whose presence is revealed to us by the shaping that in fact develops and persists in both the organic and inorganic forms we find all around us. Stuff develops one way rather than another because of an additive property of these morphic fields in both time and space. This embryo develops into that arm and finger structure at that time and place because so many other embryos so much like it have developed that way in the past. It doesn't develop into a frog leg and webbed finger-like foot because the fields that govern or form or incline its development are themselves gnerated by the proximity in time and place of earlier human embryo fields. Similar forms dominate in generating similar forms. Homology is at work as a formative cause in the process itself.
Fn1 – *Morphic Resonance (The Nature of Formative Causation)* (2009) by Rupert Sheldrake, 181.)
Hans Driesch – See Sheldrake, *Morphic Resonance,* 33ff.
n§3.2 I suppose, though, there is no reason at all to suppose that the mystery entity that causes the regrowth of *M pirum* on the sterile lymphocytes would be identical to the entitity or activity that causes the EMS. In fact, the discontinuity in the production of EMS by the several dilutions, the fact that so much dilution time elapses before we get the EMS, that would not seem to be consistent with the two effects deriving directly from the same cause. Likely, then, my supposition of their supposing is incorrect !
suggests no mechanism Except, implicitly, the nanostructures they suppose must exist in the filtrate, structures they quickly find, but have yet to identify or study very carefully. Later we will see that they do obtain sucrose density fractions from whatever it is that is still found in the filtrate. But to notice that unidentified nanopstrucvtures exist in the filtrate is not to suggest a causal mechanism. In fact, since they have not done controls with pure water, they do not know that the nanostructures are actually necessary to the growth of *M pirum* on the lymphocytes.
by using wave transfer As if that made sense. What would wave transfer be? I think of the movement of electricity through a medium being effected, one says, by the sequential nudging of things along the wave (rather than by the actual movement of electrons) – as in the motion of waves in water. In water the molecules nudge each other, transferring momentum, I think. Something, anyway, that makes the rising and falling. One might as well say, "by resonance of the morphic fields."

In preliminary experiments, we had observed that
a pretreatment of a suspension of E. Coli by 1%
formaldehyde did not alter its capacity to induce the
electromagnetic signals, while killing the bacteria. This
treatment alters the surface proteins of the bacterial
cells without attacking their genetic material, i.e.
double- helical DNA. This suggested that the source of
the signals may be the DNA itself.
Indeed, DNA extracted from the bacterial suspension
by the classical phenol: chloroform technique was able