

Performing biotechnology on the banks of the Adriatic Sea: Bioaesis (Jesi/Ancona, Italy)

Women at Work

In 2004, three young Italian biologists decided to go into business by themselves. Today, Bioaesis has become an important biotech player in the Marche region.

When your *Lab Times* reporter reaches Jesi, a small city in the hinterland of the Marche region in Northeast Italy, the sun is high in the sky. An interview had been arranged with Daniela Bianchi, the president of Bioaesis, a small young company that is campaigning under the slogan, "Innovation is young and female!".

Bioaesis, a contraction of the words Bio (biology) and aesis (the Latin for Jesi), specialises in molecular biology applications. The company supplies scores of molecular services, such as DNA analysis for the detection and quantification of genetically modified organisms, as well as chemical reagents for life sciences and medical purposes. Bioaesis was founded in 2004 by three, yes – you guessed right, female molecular biologists, Daniela Bianchi, Emanuela Simonetti and Caterina Trozzi.



The picturesque old town of Jesi (pictured above) has retained a full circuit of walls. Built in the 13th century on Roman remains, they were reinforced in 1488 by the Florentine architect Baccio Pontelli.

Stepping inside Bioaesis' head office, Daniela Bianchi immediately gives the impression of an energetic and strong-minded woman as she shakes my hand and, with a broad smile, offers me a seat. Her brisk manner is clearly visible since, as soon as we close the door, she starts to take an interest in me and my work even before I can introduce myself.

As Bianchi explains, the central core of Bioaesis' work is genetic profiling in biotechnology, agriculture and human health. In biotechnology, Bioaesis develops molecular diagnosis methods for genetic disease and polymorphism detection in susceptibility genetic tests. The company also develops molecular systems for the diagnosis of many bacterial and viral pathogens, as well as reagents for molecular analyses.

One approach for three different areas

Moreover, the Bioaesis women are collaborating with various academic laboratories. Among these are the gynaecological laboratory of Marche University, Maternity and Infant Department, headed by Andrea Tranquilli, for the validation of genetic disorders in inherited foetal thrombophilia, and the Claudio Gualerzi laboratory at the Cell and Molecular Department of Camerino University, for the validation of molecular markers to detect genetic polymorphisms associated with chronic cardiovascular and metabolic diseases. As Bianchi says, these projects are still in progress but some results are going to be published soon.

However, Bioaesis is not only working with academic laboratories. Some collaborations have also arisen with private agricultural companies. In fact, the company is collaborating with Italian farms, including the Stefano Mancinelli winery in Ancona and the Montalbera winery in Turin, and it also collaborates with the American farm Kamut Enterprises (www.kamut.com). Bioaesis supplies the know-how for genotyping producers' food and guarantees genetic traceability and product quality assessment. More generally, in the agricultural

field, Bioaesis performs analyses and genetic controls of human food and zootechnical products (genetically modified organism detection, genetic analyses of vegetable varieties, microbiology and genetic traceability). Although agriculture and biotech are the first strands to have been developed, the company today also works in the public health field and supplies services for clinical analysis and genetic screening for allergies, cancer and infertility.

Working hard without being paid

Before going into the specific scientific work of the company, Bianchi talks about her initial idea. "We graduated in molecular biology. Then I started to work as an internship student in a microbiology laboratory in the city of Torrette. In this lab, Caterina Trozzi started her work, too. We were there working hard without being paid, so I decided to move and find something different. I started to work for a small company that was producing reagent kits for the everyday use in molecular biology laboratories. After some time, Caterina and another girl, Emanuela Simonetti, entered the same company."

At a certain point, the three women understood that this work was not what they really wanted to do. "We found ourselves there, in that space between something that you have but you don't like, and something that you would like but that's totally uncertain and new. We had to decide if we wanted risk", says Bianchi, staring at me, trying to let me understand what that had meant for them at the time.

The young researchers decided to start without any additional funding, soon realising that it was, "really hard because there were no laboratories working in the field yet and we were newcomers, entering a market that didn't exist yet".

Bianchi adds, "Moreover, we had to overcome the public administration reticence to fund projects that dealt with genetic modified organisms (GMOs). The initial opposition was related to the lack of any pre-existing criteria in matter of how

to handle GMOs. So, we couldn't be conformed to something that didn't exist yet! When the public administration decided to write down the official guidelines, we conformed the company to it and we got the authorization."

Looking at the Bioaesis web page, one can see that the company has closed its many collaborations mainly with academic partners. How did they manage to do this in so little time?

"Today, I am the President of the company", Bianchi explains. "I am also the quality assessment manager and I am in charge of the molecular biology laboratory. But it has not always been this way. At the beginning, I was only in charge of the commercial part of the company and we worked together to get the company started. We worked really hard, sometimes we even spent nights working on planning new projects or proposals for possible partners. Moreover, we had been working in the molecular biology field for years, and this experience helped us."

More important than their families

Talking about the company's beginnings, Daniela Bianchi explains, "We have been lucky, because we all had the same goals and mood for what we had to stand before. When we started this adventure, we agreed that the company would always be more important than everything else, even our families and our personal interests: everything. So, if one month we don't gain enough money, we have to renounce our salary for the good of the whole company."

What about the fact that all nine Bioaesis employees are women? Is that political correctness or something that simply happened? Daniela seems irritated. "Absolutely not! Our choices are definitely guided by personal attitude and skills. We receive at least one or two curriculum vitae each day and the majority of the persons that want to work with us are women. That is the reason why we all are women." Daniela elaborates, "Whoever wants to work with us must first complete a form and then make an interview. One of the questions we ask, for example, is that everyone tries to auto-judge himself, saying which salary he or she is worthy of on the basis of the personal preparation. It is important to be able to auto-evaluate yourself!"

Bioaesis founder Daniela Bianchi develops molecular systems for the diagnosis of bacterial and viral pathogens, as well as reagents for molecular analyses.

While she answers, I understand this is a hot issue for Bianchi, so probe further. "And are you all career women or is there space for a personal life?" As an answer, Daniela shows me the photo of her three children on the screensaver of her laptop. "We sure have our families. And I want to tell you more. I have recently been granted by the public administration, the right for conciliation between work and family. So, now I have €35,000 to pay someone to replace me at work for a half day. Our government does a lot of bad things but sometimes there are also good ones and it is right to underline them when it happens!"

Thinking about the nine employees, how can such a small company keep track of all the projects in which it is involved?

Automation is the answer

"Well, the great part of our work concerns sequencing and characterisation by genotyping. This part can be easily automated. The rest – the planning, the ideas and the project management – is a mental work and we can do more than one thing at a time."

Mental work has already brought success to Bioaesis, in the form of two patented products. "The first patent is on the ►►



►► Genokit, a kit that can be delivered to customers that want to or need to make a genetic screening for susceptibility to different kinds of health disorders.”

At that moment, Bianchi jumps out of the room and returns with a small, thin cardboard box.

“Here it is. This is the Genokit. As you can see, the kit is composed of two oral tampons, one form for the personal data of each customer and an envelope to send in the sample for analysis. This kind of test can be done once in a lifetime. The people that ask for this kind of test are usually the ones that have genetic disorders in their familiar history. After genetic screening, you can be informed on your predisposition to a specific pathology. But this doesn't mean that you're sick. You only come to know if there is a probability that you will become sick.” Bianchi emphasises her next point, “In fact, there are some genetic markers that are now known to be associated with the development of certain kinds of cancers, for example, or hereditary health disorders. These markers can be identified and this can help in the disease development risk assessment.”

And what about the second patent? Bianchi explains that the second patent has been developed in association with an ani-

mal feed company, Conagit, located in Perugia, and concerns the optimisation of an experimental protocol for GMO identification in food.

In fact, European directive 1829/2003 clarifies the need for genetic traceability not only for human food but also for animal feed. Moreover, the directive points out that not only must the presence of GMOs be indicated, but also the presence of some GMO derivatives. One example is the presence of GMOs in non-GM food due to cross-contamination.

A more accurate GMO quantification

For this reason, Bioaesis and Conagit developed an experimental protocol to detect traces of genetically modified soya present in animal feed. In particular, Bianchi explains, “Even the new protocol introduced by Bioaesis and Conagit leads to the quantification and detection of GM soya, as the standard protocol does, but our method avoids any overestimation. Indeed, the standard protocol simply presents the amount of GM soya as it is relatively to the total soya. But it doesn't take into account that the GM soya in animal feed is a part of the total soya, that again is only a fraction of the total feed components. So, the real amount of GM soya is an overestimate.

The new approach introduced by Bioaesis involves first the detection of the total amount in any feed. Then, the amount of GM soya is determined and it is expressed as a fraction of the total components. This leads to a more accurate quantification of the GM soya.”

Approved by the government soon?

That the new protocol conceived at Bioaesis has gained a great success since development is evident when Daniela explains that, some months ago, all the Italian Zoo-preventive Institutes presented to the Italian Government a request for a research project aimed at the development of a protocol for the detection of GMOs in food components.

Just some days ago, the Italian Government approved the request and the Bioaesis protocol has been chosen as a good candidate for this purpose. So, in the near future the Bioaesis-Conagit patent will be formalised. In other words, the same protocol will be used for the analysis of the same samples in different public laboratories and at Bioaesis, and the agreement of results will be tested. If the project succeeds, the protocol will become an official guideline for laboratories throughout Italy.

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Female power: Daniela Bianchi (left) with her Bioaesis team.