

# New tools for earlier breast cancer diagnosis

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(PhysOrg.com) -- Modern techniques for investigating suspected breast cancer are now complementing conventional mammography. A team of European and US researchers is developing ways to combine all this data to help doctors make earlier and more accurate diagnoses.

Every year about 350,000 new cases of [breast cancer](#) are diagnosed in Europe, accounting for one in four of all cases of cancer in women.

As the causes of breast cancer are not well understood the priority is to detect it early so that effective treatment can be given. The earlier the cancer is detected the more likely the treatment is to be successful.

Many countries now employ x-ray mammography screening for women over 40 or 50 but cases still go undetected because of the difficulty of

making an accurate diagnosis. Even with a mammogram, some cancers will be unnoticed and there will be many cases of false positives that require further investigation. Confirmation is usually by ultrasound and biopsy but many biopsies will show that a suspected lump is not cancerous.

“From mammography you can't always really see if there is something serious or if it's just something that is not cancer,” says Sonja Guttenbrunner of the European Institute for [Biomedical Imaging](#) in Vienna. “Sometimes it's very difficult to detect breast cancer and often unnecessary biopsies are taken.”

## New tools to aid diagnosis

Even if cancer is confirmed, some types will never pose a risk to health but they cannot easily be distinguished from tumours that are likely to spread. The result is that many women undergo surgery, [radiotherapy](#) and chemotherapy that would not have been necessary if a more precise diagnosis were possible.

Other diagnostic tools, such as ultrasound, are commonly used as a follow-up to mammography. Newer techniques include x-ray tomosynthesis, [magnetic resonance imaging](#), positron emission mammography and automated 3D ultrasound. All these techniques reveal different information about any suspicious lump and together they can help the clinician make a more informed and accurate diagnosis.

But what is the best way to use all these sources of information? That's where the EU-funded HAMAM project comes in. HAMAM is developing a tool that will be more accurate in the diagnosis of breast cancer and be able to integrate all these different modalities in one clinical workstation, suggests Guttenbrunner who is coordinating the project.

The doctor will be able to compare different images side by side while viewing the patient's history and other information. HAMAM also aims to help clinicians with an element of computer-assisted diagnosis. The workstation will be connected to an extensive database of images and other clinical data. It will be able to suggest further investigations to guide the doctor in coming to a diagnosis.

## **Prototype workstation**

The project has a prototype workstation which is being evaluated in preparation for a public demonstration. A prototype database is available and the clinical partners have supplied anonymised patient information.

Clinical partners in the project include hospitals in Berlin, Dundee, Nijmegen and a partner in the USA. Boca Raton Community Hospital, in Florida, was chosen for their experience in using multimodal imaging in the diagnosis of breast cancer. They are supplying much of the information that is being used to construct the database.

“Breast cancer is a worldwide issue, both epidemiologically and economically, but handled differently in Europe than in the USA,” Guttenbrunner adds. “Therefore, joint research is a good way to combine the different perspectives.”

They are supported by technological partners in London, Bremen, Nijmegen and Zurich.

"At the end of the project, we want to have a workstation that can be brought to the market," she says. "We have an industrial partner, Mevis Medical Solutions, who will further develop the workstation to actually bring it to the market for clinicians."

HAMAM builds on two earlier EU-funded projects, SCREEN and

SCREEN-TRIAL, which developed approaches to reading [mammograms](#) from a digital display screen rather than from traditional x-ray films.

**More information:** HAMAM project - [www.hamam-project.org/](http://www.hamam-project.org/)

Provided by ICT Results

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