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POSTER

**Aggressive fibromatosis of the breast. Clinical, pathological & mammographic findings**

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Desmoid tumors, fibromatoses, are uncommon tumors which involve mainly the abdominal wall, the chest wall, and the limbs. Very rare is the localization to the breast. Illustrated are the clinical, pathological and mammographic findings with a discussion on their differential diagnosis from other benign or malignant tumors of the breast.

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POSTER

**The expression of proliferating antigen Ki67 and PCNA and products of suppressor gene p53 in primary invasive ductal carcinoma of female breast**

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The aim of the study was to examine the consecutive series of primary ductal invasive tumours and find out: a) the expression of some biological cellular parameters as proliferating antigens Ki67 and PCNA and products of suppressor gene p53; b) correlation between the levels of expression of those factors and classical prognostic factors. In 1994 eighty eight women were operated for primary ductal carcinoma of the breast. The material used in the study: a) tissue samples fixed in 10% buffer formaline and paraffin embedded; b) tissue samples of the same tumours to estimate levels of steroids receptors. We used monoclonal antibodies (Dakopatts). The examination of steroids receptors was done with the usage of immunoenzymatic ELISA method. The kinetics for nuclear antigens: Ki67, PCNA, p53, defined as index, has been estimated with half-quantitative method with the usage of Hogg's grating (number of positive cells/1000 cells in 10 microscopic fields). The estimation has been done by two pathologists and the final result has been reported as arithmetical mean.

**Results:** 1. High index IP PCNA, Ki67, I p53 and low levels of steroids receptors correlates with high histological malignancy (Bloom III); 2. Low index IP PCNA, Ki67, I p53 correlates with high levels of steroids receptors; 3. The estimation of high levels of index IP PCNA, IP Ki67 can be helpful for separate tumours of high proliferating activity; 4. High index of I p53 do not correlate with the diameter of tumour and with involvement of axillary lymph nodes; 5. It seems that the estimation of proliferating antigens together with products of suppressor gene p53 might have greater prognostic value than the estimation of single of those factors.

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POSTER

**Estrogen receptor analysis on breast cancer imprints**

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The routine analyses of estrogen receptor (ER) is performed in frozen breast cancer samples or in paraffin embedded material. The analyses on imprints may be a rapid and simple alternative.

**Purpose:** To compare ER analysis on imprints and in frozen tissue.

**Methods:** Imprints from frozen breast cancer tissue using the monoclonal antibodies ID5 (n = 59). Negative = no or very few stained nuclei; positive = more than a few stained nuclei.

Cytosols from frozen tissue: enzyme immuno assay (EIA). Negative: 0–2.9; weak positive: 3.0–24; positive: ≥25 fmol/mg protein

**Results:** 15 ER<sub>EIA</sub> negative samples were negative on imprints, and 32 ER<sub>EIA</sub> positive were also positive on imprints. The group of 12 cases with a weak positive ER<sub>EIA</sub> concentration showed a heterogeneous pattern on imprints, 5 negative, 6 positive and 1 was not possible to evaluate.

**Conclusions:** ER analysis on imprints and in frozen breast cancer tissue showed overall concordant results. Samples being weak ER positive in frozen tissue may, however, on imprints (cytologically identified nuclei) be separated into two groups, one ER positive and one ER negative. The clinical consequence of this finding remains to be elucidated.

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POSTER

**Case report: Primary neuroendocrine tumour of the breast**

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**Introduction:** primary neuroendocrine tumour of the breast is one of the most uncommon variants of breast carcinoma. The diagnosis can only be made if a non mammary site is excluded clinically or if an in situ component can be demonstrated histologically. In most published descriptions these criteria have not been met.

**Case Report:** a 72 years old women was studied in the Department of Gynaecology for blood discharge in her left nipple. A 1 cm tumour was detected through exploration.. Malignancy was confirmed by fine needle biopsy. The extension study was negative for other tumour sites.

**Pathology:** the tumour length was 16 mm in two separated focus and intraductal growth existed.. The histopathological degree was II/III. The immunohistochemical study of the tumour cells was positive for neuron-specific enolase, chromogranin, cytoqueratin and S100 protein. Ultrastructural study confirmed the neuroendocrine type.

**Conclusion:** this case accomplishes the criteria to be considered a primary neuroendocrine tumour of the breast.

Friday, 2 October 1998

16:00-18:00

PARALLEL SESSION

**Biology and immunology**

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INVITED

**Stromelysin-3 (ST3), from basic research to molecular medicine**

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Stromelysin-3 (ST3) is a matrix metalloproteinase (MMP) expressed in mesenchymal cells located close to epithelial cells, during physiological and pathological tissue remodeling processes (Basset et al., 1997, Crit. Rev. Oncol. Hematol., 26: 43). In human breast carcinomas, high levels of ST3 expression in intratumoral fibroblasts is found to be associated with poor clinical outcome (Chenard et al., 1996, Int. J. Cancer, 69: 448), suggesting that ST3 plays a role during malignancy. Consistent with this hypothesis, the lack of ST3 alters malignant processes in ST3 null mice (ST3<sup>-/-</sup>) (Masson et al., 1998, J. Cell Biol., 140: 1535). Altogether, these data give evidence that ST3 promotes the implantation/survival of malignant cells in host tissues, a key process for both primary tumors and metastases. ST3 therefore represents an attractive target for specific MMP inhibitor(s) in future therapeutical approaches directed against the stromal compartment of human carcinomas. Since, in contrast with malignant cells, stromal cells are genetically stable, such therapy should induce little or no acquired drug resistance, and could be used in combination with conventional cytotoxic treatments (Stetler-Stevenson et al., 1996, Semin. Cancer Biol., 7: 147; Kerbel, 1997, Nature, 390: 335).

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ORAL

**Molecular mechanisms leading to C-ERBB2 gene overexpression in breast cancers**

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**Purpose:** C-erbB2 oncogene overexpression in breast cancers is due to increased transcription. Here we characterized one a new cis element responsible for c-erbB2 overexpression.

**Methods:** Gel retardation and footprinting with nuclear proteins from the BT474 human breast adenocarcinoma cells; site directed mutagenesis; construction and transfection of reporter vectors in breast cancer cells.

**Results:** A new cis acting element, located about 500 bp upstream the CAP site, was shown to contribute to c-erbB2 mRNA overexpression in

human mammary cancer cell lines. This element contains the recognition sequence for three known transcription factors: AP2, NFkB and ETF. Preliminary experiments indicate that neither factor is responsible for c-erbB2 overexpression through this newly identified sequence. Site directed mutagenesis experiments have identified the nucleotides which are important in transactivation.

Luciferase-reporter vectors, containing the new cis element in front of the c-erbB2 minimal promoter, were constructed and transfected into BT474 cells. The transcriptional activity of the new vector was comparable to that of the native promoter fragment, showing that the new sequence does contribute to c-erbB2 overexpression in vivo. Site directed mutagenesis of the cis sequence inhibited the transcriptional activity of the promoter fragment containing it. These experiments show that the factor recognizing this new cis element is important in c-erbB2 gene overexpression in BT474 cells. We are currently realizing the experiments aimed at the identification of the transcription factor recognizing this cis element, in order to understand the mechanism leading to the oncogene's overexpression in breast cancers.

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ORAL

**Neu differentiation factor (NDF/hereregulin) induces expression of adhesion molecules, increased cellular invasiveness, and is expressed in Paget's disease of the breast together with its receptors**

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**Purpose:** This study concentrated on the biological activity of NDF, a ligand to the erbB receptor family, on the migration of breast cancer cells to the epidermis in breast cancer cells and Paget's disease of the breast. NDF binds to erbB-2, erbB-3 and erbB-4 receptor tyrosine kinases and induces either cell growth or differentiation.

**Methods:** We used immunohistochemistry combined with quantitative image analysis, or the polymerase chain reaction (PCR).

**Results:** NDF induced integrin molecules; specifically  $\beta_1$ ,  $\alpha_2$ ,  $\alpha_3$ ,  $\alpha_5$ , the adhesion molecule CD44. This was accompanied by increased cellular invasiveness. Since NDF contributes to the invasiveness of cancer cells, we investigated the presence of erbB family receptors and NDF. All specimens overexpressed erbB-1, erbB-2, erbB-3, erbB-4 and NDF and integrins associated with migration of cancer cells and keratinocytes.

**Conclusion:** An autocrine loop involving NDF and its receptors may be operative in Paget's disease of the breast, contributing to their invasive characteristics of the cancer cells.

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ORAL

**Multisite phosphotyping of the ErbB2 oncoprotein in 102 human breast cancers**

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**Purpose:** The commonest receptor tyrosine kinase overexpressed in human tumours is the unliganded ErbB2. By analyzing patterns of multisite phosphorylation within tumour-associated ErbB2, we have aimed to clarify its pathogenetic role and clinical significance.

**Methods:** A panel of reagents has been prepared which permits selective analysis of differentially phosphorylated ErbB2 isoforms. Conventional experimental techniques were used to establish the in vitro significance of these isoforms, while clinical correlations were sought to determine their prognostic implications.

**Results:** In vitro studies implicate ErbB2 as a molecule which amplifies the signalling of ambient growth factors by preventing the downregulation of heterodimerized receptors. Multisite ErbB2 phosphotyping was approximately twice as sensitive as conventional immunohistochemical staining for ErbB2 expression, indicating that up to 60% of human breast tumours 'oversignal' via ErbB2. In a small cohort of patients with accessible clinical information, survival was far poorer in the presence of a detectable Tyr<sup>1248</sup> or Ser<sup>1113</sup> phosphorylation signal.

**Conclusion:** ErbB2 phosphotyping contributes more information as to tumour biology and prognosis than does traditional immunohistochemical analysis, suggesting a new dimension in the molecular characterization of human tissues.

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ORAL

**Mutations in the p53 gene, both within and outside the zinc-binding domains, are associated with increased apoptosis and mitosis in invasive breast carcinomas**

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In breast cancer, mutations located in the zinc-binding functional domains of the p53 gene have been associated with worse prognosis and worse response to treatment with doxorubicin, compared to mutations in other parts within exons 5-8 of the gene. To investigate whether these specific p53 mutations are associated with differences in rate of apoptosis and/or mitosis or expression of the anti-apoptotic Bcl-2 protein, we evaluated these parameters in 93 invasive breast cancers with a confirmed p53 mutation in exon 5-8 and in 99 tumors with no p53 mutation. Apoptotic cells were identified by morphological criteria and staining of DNA strand breaks (TUNEL-assay). Tumors with mutations in the zinc binding domains did not differ in their mitotic or apoptotic activity from tumors with mutations outside these domains. However, compared to the wild type p53 tumors, both mean apoptotic and mitotic levels were approximately two-fold increased in the mutant p53 group ( $p < 0.001$ ). Presence of a p53 mutation was also associated with necrosis ( $p < 0.001$ ), high tumor grade ( $p < 0.001$ ) and low expression of Bcl-2 ( $p < 0.001$ ). Accumulation of cellular p53 as detected by immunohistochemistry (IHC) correlated strongly with the presence of missense mutations and, with few exceptions, tumors with p53 frameshift or stop codon mutations were completely negative after IHC. Our data support the concept that in invasive breast carcinoma loss of p53 function is involved in enhanced proliferation rather than decreased apoptosis and that the resulting acceleration of cell turnover may enhance clonal evolution and tumor progression.

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ORAL

**ICAM-1 up-regulation expression on breast cancer cell lines after all-trans retinoic acid (ATRA) treatment is independent of hormonal receptor conditions**

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Intercellular adhesion molecule-1 (ICAM-1, CD54) is referred as playing a key role in the multiple interactions between tumor cells and the effectors of the immune system. Recent reports on defective or reduced expression of ICAM-1 molecule on breast cancer tissues can be linked to the impaired cytotoxic effects observed in vivo. The reduced expression of ICAM-1 constitutes a potential mechanism by which breast cancer cells escape immunologic recognition and lysis by the appropriate effector cells. ATRA is currently used in many clinical trials because of its ability to induce growth inhibition, while in breast cancer it apparently acts by favoring chemoprevention and differentiation. These observations led us to investigate the effects of ATRA on surface expression of ICAM-1 in three breast cancer cell lines, two of them hormone-responsive (T47D, MCF-7) and one non hormone-responsive (MB-MDA-231).

The results showed that: i) ICAM-1 expression is increased in all three cell lines and ii) the increment is observed independently of their hormonal receptor status. Lastly, iii) ICAM-1 up-modulation is time- and dose-dependent and is reversible. Other differentiating and proliferating agents tested, e.g. DMSO, progesterone, estradiol or dexamethasone, do not exert detectable effects on the molecule.

The inferences derived from these results suggest that i) the effects mediated by ATRA include a significant and reproducible up-modulation of ICAM-1. Moreover, ii) ICAM-1 could consequently represent a mechanism through which ATRA acts by improving the endogenous cellular defenses against tumor. iii) Further relevance for in vivo treatment is that the up-regulatory effects are not linked to the expression of the estrogen and progesterone receptors.