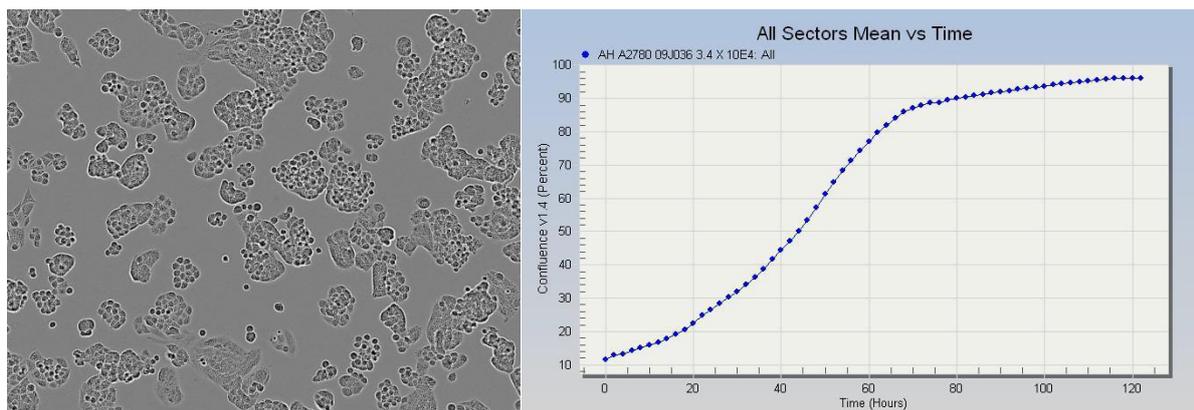


## Cell line profile

### Ovarian Cancer cell line A2780 (ECACC catalogue no. 93112519)

The ovarian cancer cell line A2780 is uniquely deposited with ECACC and is one of its most frequently requested cell lines. This cell line was established from an ovarian endometroid adenocarcinoma tumour in an untreated patient and is commonly used as a model for ovarian cancer to observe the effects and test the potency of various chemicals, methods of delivery and treatments.



A2780, 48 hours post seeding

A2780 Growth Curve

## Cell Line History

A2780 is an ovarian cancer cell line that was established from an Ovarian endometroid adenocarcinoma tumour in an untreated patient. It was deposited with ECACC by Dr T H Ward, from the Cell Culture Unit of the Patterson Laboratories, at the Christie Hospital in Manchester. The cell line has an epithelial morphology and cells grow as a monolayer in tissue culture flasks and in suspension in spinner cultures.

The patient from whom the A2780 cell line was established, did not receive treatment for their tumour before tissue was taken, and so the cell line has not been exposed to any anti-cancer drugs or chemicals. It is commonly used as a model to observe the effects of, and test the potency of various chemicals, methods of delivery and treatments for ovarian cancer.



## Drug Resistant Variant Cell Lines

Two drug resistant A2780 cell line variants are also available from the ECACC general collection:

[A2780 cis \(ECACC catalogue no. 93112517\)](#) A Cisplatin resistant cell line and

[A2780 ADR \(ECACC catalogue no. 93112520\)](#) An Adriamycin (Doxorubicin) resistant cell line

Cisplatin, or cis-diaminedichloroplatinum the drug most commonly associated with studies involving A2780, is comprised of a doubly charged platinum ion surrounded by four ligands (two amine and two chloride). It is used as an anti-cancer drug. The mode of action for cisplatin is thought to be as a result of its ability to crosslink with purine bases in DNA, interfering with DNA repair mechanisms. Several Cisplatin resistant A2780 cell lines have been independently developed and studies with these have reported, variously, resistance occurring as a result of increased drug efflux, leading to a reduction in the number of single strand DNA breaks induced; that resistance is due to DNA repair and tolerance to DNA damage.

Changes in gene copy number have been associated with drug resistance of cell lines. Further reports of work with cisplatin resistant cell lines suggested that elevated expression of extra cellular matrix proteins, particularly collagen VI were associated with drug resistance.

Cisplatin is used in combination with other chemical agents or compounds to treat ovarian cancer in both the resistant and sensitive cell lines. For example, Cisplatin is used along with honey venom (Alizadehnohi, Nabiuni et al., 2012), withaferin (Kakar, Jala et al., 2012), trichostatin A or 5-aza-2'-deoxycytidine (Meng, Sun et al., 2013). Another study details overcoming chemotherapy resistance of ovarian cancer cells by use of liposomal Cisplatin (Koch, Krieger et al., 2013).

At least 26 drug resistant cell lines have been created from the original A2780 cell line, including cell lines resistant to Carboplatin, Antracycline or Topotecan. Drug resistant A2780 cell line variants have been used to investigate the mechanisms for drug resistance in cancer, and to look at strategies for overcoming drug resistance (see references below).

## Related Links

[Cellosaurus](#): (A database bringing together information on all immortalised cell lines)

[The National Center for Biotechnology Information \*Cisplatin in cancer therapy: molecular mechanisms of action\*](#)

[The National Center for Biotechnology Information \*Ovarian cancer cell line panel study comparing 39 ovarian cancer cell lines showing the importance of morphological subtypes of cancer\*](#)

[Nature Biotechnology \*A comprehensive transcriptional portrait of human cancer cell lines\*](#)



## A2780 Cell Line STR profile

DNA Profile:

STR-PCR Data:

Amelogenin: X  
CSF1PO: 10,11  
D13S317: 12,13  
D16S539: 11,13  
D5S818: 11,12  
D7S820: 10  
THO1: 6  
TPOX: 8,10  
vWA: 15,16

SoftGenetics

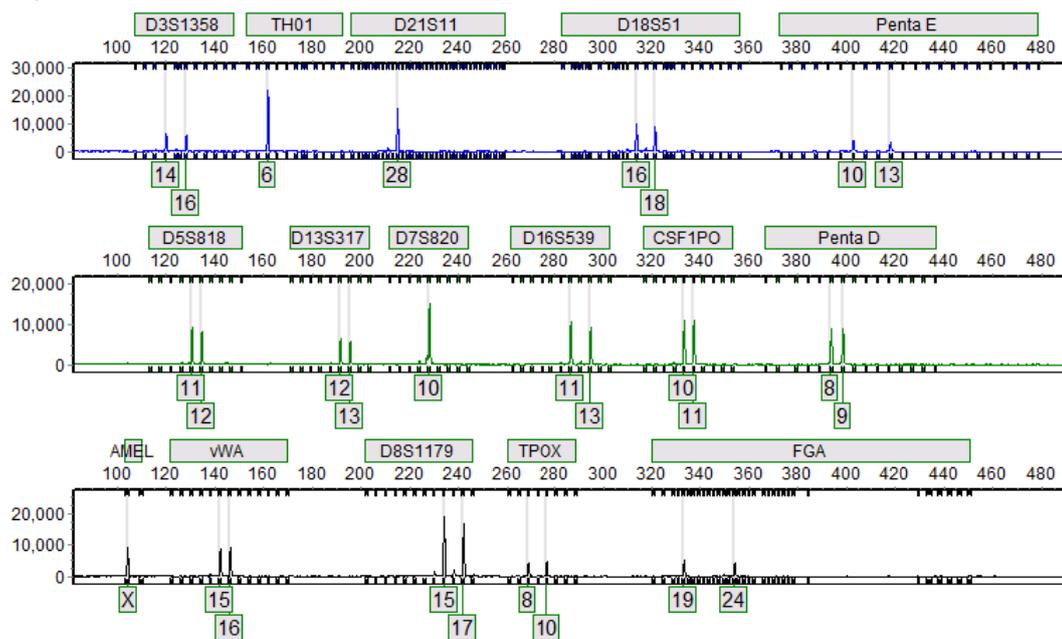
### Allele Report

11/28/2011 6:23:44 PM

GeneMarker HID V1.90

Page 30

Sample 30: 133693\_A11\_048.fsa





## References

### Cancer treatments and resistance

[The synergistic cytotoxic effect of cisplatin and honey bee venom on human ovarian cancer cell line A2780cp.](#) J.Venom.Res. 2012;3:22–27

[Synergistic cytotoxic action of cisplatin and withaferin A on ovarian cancer cell lines](#) Biochem.Biophys.Res.Commun. 2012;423:819–825

[Anticancer efficacy of cisplatin and trichostatin A or 5-aza-2'-deoxycytidine on ovarian cancer](#) Br.J.Cancer. 2013;108:579–586

[Overcoming chemotherapy resistance of ovarian cancer cells by liposomal cisplatin: molecular mechanisms unveiled by gene expression profiling](#) Biochem.Pharmacol. 2013;85:1077–1090

[Betulinic Acid and its Derivatives as Potential Antitumor Agents](#) Med Res Rev. 2015 Nov;35(6):1127-55. doi: 10.1002/med.21353. Epub 2015 Jun 2

[89Zr-Labeled N-succinyl-desferrioxamine-ranibizumab](#) Molecular Imaging and Contrast Agent Database (MICAD) [Internet]. Bethesda (MD): National Center for Biotechnology Information (US); 2004-2013. 2011 Jan 26 [updated 2011 Feb 24]

[Gemcitabine reverses platinum resistance in platinum-resistant ovarian and peritoneal carcinoma](#) Int J Gynecol Cancer. 2005 May-Jun;15 Suppl 1:18-22

[Meta-analysis of the role of p53 status in isogenic systems tested for sensitivity to cytotoxic antineoplastic drugs](#) Biochim Biophys Acta. 2004 Dec 17;1705(2):103-20

[Combined cancer therapy by micellar-encapsulated drug and ultrasound](#) Int J Pharm. 2004 Jun 11;277 (1-2):155-62

[Cytoplasmic delivery and nuclear targeting of synthetic macromolecules](#) J Control Release. 2003 Feb 21;87 (1-3):89-105

["Comparative proteomic analysis of paclitaxel sensitive A2780 epithelial ovarian cancer cell line and its resistant counterpart A2780TC1 by 2D-DIGE: the role of ERp57"](#) J. Proteome Res. 8:1902-1912(2009)

["Genomic complexity and AKT dependence in serous ovarian cancer"](#) Cancer Discov. 2:56-67(2012)



### A2780 as a model for ovarian cancer

["DNA profiling analysis of endometrial and ovarian cell lines reveals misidentification, redundancy and contamination"](#) Gynecol. Oncol. 127:241-248(2012)

["Evaluating cell lines as tumour models by comparison of genomic profiles"](#) Nat. Commun. 4:2126-2126(2013)

["Evidence that both genetic instability and selection contribute to the accumulation of chromosome alterations in cancer"](#) Carcinogenesis 26:923-930(2005)

["Type-specific cell line models for type-specific ovarian cancer research"](#) PLoS ONE 8:E72162-E72162(2013)

["A comprehensive transcriptional portrait of human cancer cell lines"](#) Nat. Biotechnol. 33:306-312(2015)

[Ovarian cancer stem cells](#) Neoplasma. 2012;59(6):747-55. doi: 10.4149/neo\_2012\_094

[Overexpression of the centrosomal protein Aurora-A kinase is associated with poor prognosis in epithelial ovarian cancer patients](#) Clin Cancer Res. 2007 Jul 15;13(14):4098-104

["CL100 expression is down-regulated in advanced epithelial ovarian cancer and its re-expression decreases its malignant potential"](#) Oncogene 21:4435-4447(2002)

### A2780 Cell Line Variants

A2780-DX1, A2780-DX2, A2780-DX-3, A2780-DX-4, A2780-DX-5 and A2780-DX-6 (2,7, 26 and 48 fold resistant respectively after 2 hours exposure to doxorubicin, 30, 50 and 500 fold resistant after 72hours exposure). <http://www.ncbi.nlm.nih.gov/pubmed/2598402>

A2780/ACR6 cisplatin resistant via elevated ECM gene expression particularly collagen IV protein <http://www.sciencedirect.com/science/article/pii/S1535610803000588>

A2780/ACRP Cisplatin resistant to higher level than ACR6 and acquired cross resistance to doxorubicin and taxol <http://www.sciencedirect.com/science/article/pii/S1535610803000588>

A2780/C200 cisplatin resistant cell line demonstrating that DNA repair and tolerance to DNA damage by cells contribute to cisplatin resistance  
<http://www.ncbi.nlm.nih.gov/pubmed/7954422>

A2780/C30 cisplatin resistant cell line demonstrating that DNA repair an tolerance to DNA damage by cells contribute to cisplatin resistance  
<http://www.ncbi.nlm.nih.gov/pubmed/7954422>



A2780/CBP selected for resistance to carboplatin 'expression of p53, Irf-1 and mrp-1 was decreased, while the expression of pkc, topo I and topo II  $\beta$  was increased in the resistant tumor cells' <http://www.ncbi.nlm.nih.gov/pubmed/15254775>

A2780/CDDP selected for resistance to cisplatin 'expression of p53, Irf-1 and mrp-1 was decreased, while the expression of pkc, topo I and topo II  $\beta$  was increased in the resistant tumor cells' <http://www.ncbi.nlm.nih.gov/pubmed/15254775>

A2780/cDDP cisplatin resistance associated with changes in gene copy number  
<http://www.ncbi.nlm.nih.gov/pubmed/14973057>

A2780/CP70 cisplatin resistant cell line demonstrating that DNA repair an tolerance to DNA damage by cells contribute to cisplatin resistance  
<http://www.ncbi.nlm.nih.gov/pubmed/7954422>

A2780/TPT selected for resistance to Topotecan overexpression of BCRP which mediated drug efflux may play an important role in the induction of TPT-resistance  
<http://www.ncbi.nlm.nih.gov/pubmed/15196431>

A2780ADR Doxorubicin resistant cell line <http://www.ncbi.nlm.nih.gov/pubmed/25230021>  
Part of ovarian cancer cell line panel study comparing 39 ovarian cancer cell lines showing the importance of morphological subtypes of cancer. Spindle cell morphology was associated with metastases

A2780cis Cisplatin resistant cell line <http://www.ncbi.nlm.nih.gov/pubmed/25230021>  
Part of ovarian cancer cell line panel study comparing 39 ovarian cancer cell lines showing the importance of morphological subtypes of cancer. Spindle cell morphology was associated with metastases