

February

2011

Product Development Pipeline

Product Development Pipeline February 2011

| Therapeutic area | Compound/Vaccine | Type | Indication | Phase | Achieved Regulatory Review Milestones | | |
|---|---|---|--|----------------------|---------------------------------------|------------------------------|--|
| | | | | | MAA | NDA/BLA | |
| Biopharmaceuticals | 933776 | beta amyloid monoclonal antibody | Alzheimer's disease | I | | | |
| | 1070806 | IL18 monoclonal antibody | metabolic disorders | I | | | |
| | 1223249 | NOGO-A monoclonal antibody | amyotrophic lateral sclerosis & multiple sclerosis | I | | | |
| | 2401502 [†] | domain antibody targetted multi-component vaccine | malignant melanoma | I | | | |
| | 2586881 (APN01) [†] | recombinant human angiotensin converting enzyme 2 | acute respiratory distress syndrome | I | | | |
| | iboctadekin [†] (+ <i>Doxil</i>) | IL18 immunomodulator (+ topoisomerase II inhibitor) | ovarian cancer | I | | | |
| | otelixizumab [†] | anti-CD3 monoclonal antibody (i.v.) | Graves eye disease | I | | | |
| | otelixizumab [†] | anti-CD3 monoclonal antibody (s.c. & i.v.) | rheumatoid arthritis | I | | | |
| | otelixizumab [†] | anti-CD3 monoclonal antibody (s.c.) | type 1 diabetes | I | | | |
| | 249320 | myelin-associated glycoprotein monoclonal antibody | stroke | II | | | |
| | 315234 | oncostatin M monoclonal antibody | rheumatoid arthritis | II | | | |
| | 768974 [†] | parathyroid hormone | osteoporosis | II | | | |
| | albiglutide [†] | glucagon-like peptide 1 (GLP 1) agonist | heart failure | II | | | |
| | <i>Benlysta</i> [†] | anti-B lymphocyte stimulator monoclonal antibody (s.c.) | systemic lupus erythematosus | II | | | |
| | mepolizumab | anti-IL5 monoclonal antibody | severe asthma & nasal polyposis | II | | | |
| | ofatumumab [†] | anti-CD20 human monoclonal antibody (s.c.) | multiple sclerosis | II | | | |
| | ofatumumab [†] | anti-CD20 human monoclonal antibody (s.c.) | rheumatoid arthritis | II | | | |
| | otelixizumab [†] | anti-CD3 monoclonal antibody (i.v.) | myaesthesia gravis | II | | | |
| | albiglutide [†] | GLP 1 agonist | type 2 diabetes | II | | | |
| | <i>Arzerra</i> [†] | anti-CD20 human monoclonal antibody | chronic lymphocytic leukaemia, first line therapy & use in relapsed patients | III | | | |
| | <i>Arzerra</i> [†] | anti-CD20 human monoclonal antibody | diffuse large B cell lymphoma (relapsed patients) | III | | | |
| | otelixizumab [†] | anti-CD3 monoclonal antibody (i.v.) | follicular lymphoma (refractory & relapsed patients) | III | | | |
| | <i>Benlysta</i> [†] | anti-B lymphocyte stimulator monoclonal antibody (i.v.) | type 1 diabetes | Submitted | S: Jun10 | S: Jun10 | |
| denosumab [†] | anti-receptor activator for nuclear kappa (RANK) ligand human monoclonal antibody | bone metastatic disease | Submitted | N/A | N/A | | |
| <i>Arzerra</i> [†] | anti-CD20 human monoclonal antibody | chronic lymphocytic leukaemia (refractory patients) | Approved | A: Apr10 | A: Oct09 | | |
| <i>Prolia</i> [†] | anti-RANK ligand human monoclonal antibody | hormone ablative/chemotherapy bone loss in prostate cancer patients | Approved | N/A | N/A | | |
| <i>Prolia</i> [†] | anti-RANK ligand human monoclonal antibody | postmenopausal osteoporosis | Approved | A: May10 | N/A | | |
| Cardiovascular & Metabolic | 1614235 [†] | sodium dependent glucose transport (SGLT1) inhibitor | type 2 diabetes | I | | | |
| | 2245840 | SIRT1 activator | sarcopaenia (also COPD & psoriasis) | I | | | |
| | 256073 | high affinity nicotinic acid receptor (HM74A) agonist | metabolic disorders | II | | | |
| | 557296 | oxytocin antagonist | premature ejaculation | II | | | |
| | 1278863 | prolyl hydroxylase inhibitor | anaemia associated with chronic renal disease | II | | | |
| | 1278863 | prolyl hydroxylase inhibitor | peripheral arterial disease | II | | | |
| | 1292263 | G-protein coupled receptor 119 (GPR119) agonist | metabolic disorders | II | | | |
| | 1521498 | mu-opioid receptor inverse agonist | compulsive eating disorders | II | | | |
| | 2245840 | SIRT1 activator | type 2 diabetes (also COPD & psoriasis) | II | | | |
| | losmapimod | p38 kinase inhibitor | cardiovascular disease (also COPD & pain) | II | | | |
| | retosiban | oxytocin antagonist | threatened pre-term labour | II | | | |
| | rilapladib [†] | Lp-PLA2 inhibitor | atherosclerosis | II | | | |
| | darapladib [†] | Lp-PLA2 inhibitor | atherosclerosis | III | | | |
| | <i>Arixtra</i> | synthetic factor Xa inhibitor | treatment of acute coronary syndrome | Approved | A: Aug07 | AL: Feb07 & Sep07 | |
| | Infectious Diseases | 2251052 [†] | leucyl t-RNA synthetase inhibitor (oral & iv) | bacterial infections | I | | |
| | | 2336805 | hepatitis C virus inhibitor | hepatitis C | I | | |
| | | 2485852 | hepatitis C virus inhibitor | hepatitis C | I | | |
| 1322322 | | polypeptide deformylase inhibitor | bacterial infections | II | | | |
| tafenoquine [†] | | 8-aminoquinoline | Plasmodium vivax malaria | II | | | |
| <i>Relenza</i> [†] | | neuraminidase inhibitor (i.v.) | influenza | III | | | |
| Neurosciences | 2018682 | sphingosine-1-phosphate receptor 1 (S1P1) agonist | multiple sclerosis | I | | | |
| | 239512 | histamine H3 antagonist | dementia & schizophrenia | II | | | |
| | 649868 [†] | orexin antagonist | sleep disorders | II | | | |
| | 742457 | 5HT6 antagonist | dementia | II | | | |
| | firategrast [†] | dual alpha4 integrin antagonist (VLA4) | multiple sclerosis | II | | | |
| | <i>Horizant</i> [†] | voltage-gated calcium channel modulator | post-herpetic neuralgia | II | N/A | | |
| | losmapimod | p38 kinase inhibitor | pain (also cardiovascular disease & COPD) | II | | | |
| | orvepitant | NK1 antagonist | depression & anxiety | II | | | |
| | IPX066 [†] | dopamine precursor + DOPA decarboxylase inhibitor | Parkinson's disease | III | | N/A | |
| | <i>Horizant</i> [†] | voltage-gated calcium channel modulator | restless legs syndrome | Submitted | | S: Sep08 Jan09 & Oct10 | |
| | <i>Trobalt/Potiga</i> (retigabine/ezogabine) [†] | neuronal potassium channel opener | epilepsy – partial seizures | Submitted | PO: Jan11 | CR: Nov10 | |
| Oncology | 2110183 | AKT protein kinase inhibitor | cancer | I | | | |
| | 2126458 | PI3 kinase inhibitor | cancer | I | | | |
| | 2141795 | AKT protein kinase inhibitor | cancer | I | | | |
| | 2256098 | focal adhesion kinase inhibitor | cancer | I | | | |
| | vestipitant | NK1 antagonist (i.v.) | post operative nausea & vomiting | I | | | |
| | 1120212 [†] + BKM120 | mitogen-activated protein kinase inhibitor (MEK1/2) + Pi3 kinase inhibitor | cancer | I | | | |
| | 1120212 [†] | MEK1/2 inhibitor | pancreatic cancer | II | | | |
| | 1120212 [†] + 2118436 | MEK1/2 inhibitor + BRAF protein kinase inhibitor | metastatic melanoma | II | | | |
| | 2285921 [†] | thrombopoietin receptor agonist | thrombocytopenia | II | | | |
| | foretinib [†] | mesenchymal-epithelial transition factor (C-met) kinase inhibitor | papillary renal cell carcinoma and other cancers | II | | | |
| | <i>RevoladelPromacta</i> [†] | thrombopoietin receptor agonist | oncology-related thrombocytopenia | II | | | |
| | 1120212 [†] | MEK1/2 inhibitor | metastatic melanoma | III | | | |
| | 2118436 | BRAF protein kinase inhibitor | metastatic melanoma | III | | | |
| | <i>Votrient</i> | multi-kinase angiogenesis inhibitor | ovarian cancer, maintenance therapy | III | | | |
| | <i>RevoladelPromacta</i> [†] | thrombopoietin receptor agonist | chronic liver disease induced thrombocytopenia | III | | | |
| | <i>RevoladelPromacta</i> [†] | thrombopoietin receptor agonist | hepatitis C induced thrombocytopenia | III | | | |
| | <i>Tyverb/Tykerb</i> | Her2 and EGFR dual kinase inhibitor | breast cancer, adjuvant therapy | III | | | |
| | <i>Tyverb/Tykerb</i> | Her2 and EGFR dual kinase inhibitor | gastric cancer | III | | | |
| | <i>Tyverb/Tykerb</i> | Her2 and EGFR dual kinase inhibitor | head & neck squamous cell carcinoma (resectable disease) | III | | | |
| | <i>Votrient</i> | multi-kinase angiogenesis inhibitor | renal cell cancer, adjuvant therapy | III | | | |
| | <i>Votrient</i> | multi-kinase angiogenesis inhibitor | sarcoma | III | | | |
| | <i>Votrient + Tyverb/Tykerb</i> | multi-kinase angiogenesis inhibitor + Her2 and EGFR dual kinase inhibitor | inflammatory breast cancer | III | | | |
| | <i>Avodart</i> | 5-alpha reductase inhibitor | reduction in the risk of prostate cancer | Submitted | S: Sep09 & Mar10 | CR: Jan11 | |
| <i>Duodart/Jalyn</i> | 5-alpha reductase inhibitor + alpha blocker | benign prostatic hyperplasia - fixed dose combination | Approved | A: Mar10 | A: Jun10 | | |
| <i>RevoladelPromacta</i> [†] | thrombopoietin receptor agonist | idiopathic thrombocytopenic purpura | Approved | A: Mar10 | A: Nov08 | | |
| <i>Tyverb/Tykerb</i> | Her2 and EGFR dual kinase inhibitor | breast cancer, first line therapy | Approved | A: Jun10 | A: Jan10 | | |
| <i>Votrient</i> | multi-kinase angiogenesis inhibitor | renal cell cancer | Approved | A: Jun10 | A: Oct09 | | |
| Ophthalmology | pazopanib | multi-kinase angiogenesis inhibitor (oral) | age-related macular degeneration (also cancer indications) | I | | | |
| | pazopanib | multi-kinase angiogenesis inhibitor (eye drops) | age-related macular degeneration | II | | | |
| | 610677 | p38 kinase inhibitor (inhaled) | COPD | I | | | |
| | 705498 | transient receptor potential vanilloid (TRPV1) antagonist (topical) | pruritis | I | | | |
| | 1322888 | motilin receptor agonist | delayed gastric emptying | I | | | |
| | 1325756 | chemokine receptor (CXCR2) antagonist | COPD | I | | | |
| | 1440115 | urotensin antagonist | asthma | I | | | |
| | 2245840 | SIRT1 activator | COPD (also type 2 diabetes & sarcopaenia) | I | | | |
| | 2245840 | SIRT1 activator | psoriasis (also type 2 diabetes & sarcopaenia) | II | | | |
| | 256066 | PDE4 inhibitor (inhaled) | COPD | II | | | |
| 656933 | chemokine receptor (CXCR2) antagonist | cystic fibrosis | II | | | | |
| 685698 | glucocorticoid agonist | asthma | II | | | | |
| 681323 | p38 kinase inhibitor (i.v.) | acute lung injury & acute respiratory distress syndrome | II | | | | |
| 705498 | transient receptor potential vanilloid (TRPV1) antagonist (intranasal) | non-allergic rhinitis | II | | | | |
| 870086 | novel glucocorticoid agonist (inhaled) | asthma | II | | | | |
| 870086 | novel glucocorticoid agonist (topical) | atopic dermatitis | II | | | | |
| 961081 [†] | muscarinic antagonist, beta2 agonist | COPD | II | | | | |
| 962040 | motilin receptor agonist | delayed gastric emptying | II | | | | |
| 1399686 | anti-inflammatory macrolide conjugate (oral) | inflammatory bowel disease | II | | | | |
| 2190915 [†] | 5-lipoxygenase-activating protein (FLAP) inhibitor | asthma | II | | | | |
| losmapimod | p38 kinase inhibitor (oral) | COPD (also cardiovascular disease & pain) | II | | | | |
| 573719 | muscarinic acetylcholine antagonist | COPD | III | | | | |
| 573719 + vilanterol (642444) [†] | muscarinic acetylcholine antagonist + long-acting beta2 agonist | COPD | III | | | | |
| vilanterol (642444) [†] | long-acting beta2 agonist | COPD | III | | | | |
| 1605786 (CCX282) [†] | CCR9 antagonist | Crohn's disease | III | | | | |
| <i>Relovair</i> (vilanterol [†] + 685698) | long-acting beta2 agonist + glucocorticoid agonist | asthma | III | | | | |
| <i>Relovair</i> (vilanterol [†] + 685698) | long-acting beta2 agonist + glucocorticoid agonist conjugated | COPD | III | | | | |
| Paediatric Vaccines | Heptavalent combination vaccine | conjugated | Neisseria meningitis C, Haemophilus influenzae type b, diphtheria, Hepatitis B, tetanus, pertussis and poliomyelitis disease prophylaxis | II | | | |
| | MMR | live attenuated | measles, mumps, rubella prophylaxis | II (US) | A: Oct03 | | |
| | S. pneumoniae paediatric next generation | recombinant - conjugated | Streptococcus pneumoniae disease prophylaxis | II | | | |
| | <i>Mosquirix</i> | recombinant | malaria prophylaxis (Plasmodium falciparum) | III | | N/A | |
| | <i>Nimenrix</i> (MenACWY-TT) | conjugated | Neisseria meningitis groups A, C, W & Y disease prophylaxis | Submitted | | | |
| <i>MenHibrix</i> (Hib-MenCY-TT) | conjugated | Neisseria meningitis groups C & Y & Haemophilus influenzae type b disease prophylaxis | Submitted | N/A | CR: Jun10 | | |
| Other Vaccines | Flu pandemic [†] | cell-culture based H5N1 vaccine | pandemic influenza prophylaxis | I | | | |
| | HIV | recombinant | HIV disease prophylaxis | I | | | |
| | HIV | recombinant | HIV disease immunotherapy | II | | | |
| | Tuberculosis | recombinant | tuberculosis prophylaxis | II | | | |
| | Flu vaccine | inactivated split - quadrivalent | seasonal influenza prophylaxis | III | | | |
| | Zoster | recombinant | Herpes Zoster prevention | III | | | |
| | Flu (pre-) pandemic | H5N1 inactivated split - monovalent (Quebec) | pre-pandemic & pandemic influenza prophylaxis | Submitted | N/A | S: Jun09 (Canada) | |
| <i>Pumarix</i> | H5N1 inactivated split - monovalent (Quebec) | pandemic influenza prophylaxis | Submitted | PO: Nov10 | N/A | | |
| Antigen Specific Cancer Immunotherapeutic (ASCI) | PRAME | recombinant | treatment of metastatic melanoma | I | | | |
| | PRAME | recombinant | treatment of resectable non-small cell lung cancer | I | | | |
| | NY-ESO-1 | recombinant | treatment of metastatic melanoma | I | | | |
| | WT1 | recombinant | treatment of acute myelogenous leukaemia | II | | | |
| | MAGE-A3 | recombinant | treatment of melanoma | III | | | |
| | MAGE-A3 | recombinant | treatment of non-small cell lung cancer | III | | | |
| Rare Diseases | 2696273 [†] | ex-vivo stem cell gene therapy | adenosine deaminase severe combined immune deficiency (ADA-SCID) | III | | | |
| | 2402968 [†] | antisense oligonucleotide | Duchenne muscular dystrophy | III | | | |
| | migalastat HCl [†] | pharmacological chaperone | Fabry disease | III | | | |
| | tazarotene foam | retinoid foam | acne vulgaris | III | | | |
| | <i>Duac</i> low dose | clindamycin/benzoyl peroxide gel | acne vulgaris | Submitted | | S: Nov10 | |
| | <i>Sorilux</i> (calcipotriene foam) | vitamin D3 analog | mild to moderate plaque psoriasis | Approved | | A: Oct10 | |
| | itraconazole tablets | oral anti-fungal | onychomycosis | Approved | | A: Apr10 | |
| | <i>Veltin</i> | antibiotic/retinoid gel | acne vulgaris | Approved | | A: Jul10 | |
| | 1265744 [†] | HIV integrase inhibitor (long-acting formulation) | HIV infections | I | | | |
| | 2248761 [†] | non-nucleoside reverse transcriptase inhibitor | HIV infections | II | | | |
| PF-232798 | CCR5 antagonist | HIV infections | II | | | | |
| UK-453061 | non-nucleoside reverse transcriptase inhibitor | HIV infections | II | | | | |
| 1349572 [†] | HIV integrase inhibitor | HIV infections | III | | | | |
| 1349572 [†] + abacavir sulphate + lamivudine | HIV integrase inhibitor + reverse transcriptase inhibitors (fixed dose combination) | HIV infections | III | | | | |

Key

| | | | |
|-------|--|-----------|---|
| † | In-license or other alliance relationship with third party | BLA | Biological License Application |
| S | Month of first submission | MAA | Marketing Authorisation Application (Europe) |
| A | Month of first regulatory approval (for MAA, this is the first EU approval letter) | NDA | New Drug Application (USA) |
| AL/CR | Month Approvable or Complete Response Letter received - indicates that ultimately approval can be given subject to resolution of outstanding queries | Phase I | Evaluation of clinical pharmacology, usually conducted in volunteers |
| | | Phase II | Determination of dose and initial evaluation of efficacy, conducted in a small number of patients |
| PO | Month of EU Positive Opinion | Phase III | Large comparative study (compound versus placebo and/or established treatment) in patients to establish clinical benefit and safety |
| TA | FDA Tentative Approval | | |

MAA and NDA/BLA regulatory review milestones shown in the table below are those that have been achieved. Future filing dates are not included in this list.

Estimated submission dates are only disclosed where they are within 12 months of the date of the chart. This date represents the most likely year of submission where it is considered that there is a reasonably high probability of successfully meeting the date assuming the clinical data meets the expected end-points of the clinical trials.

Brand names appearing in italics are trademarks either owned by and/or licensed to GlaxoSmithKline or associated companies, with the exception of Doxil, a trademark of the Alza Corporation in the USA.

Product Development Pipeline February 2011

This document outlines GlaxoSmithKline's drug development portfolio. The content of the drug development portfolio will change over time as new compounds progress from discovery to development and from development to the market. Owing to the nature of the drug development process, many of these

compounds, especially those in early stages of investigation, may be terminated as they progress through development. For competitive reasons, new projects in pre-clinical development have not been disclosed and some project types may not have been identified.

Option-based alliances with third parties that include assets in Phase I or later development

| Company | Disease Area | Phase |
|-------------------------------------|---------------------------------------|---------|
| Cancer Research UK | cancer | I |
| ChemoCentryx | inflammatory disease | I* & II |
| Galapagos | autoimmune disease | I* |
| OncoMed Pharmaceuticals | oncology | I* |
| Prosensa Therapeutics | neuroscience | I |
| Ranbaxy Laboratories | respiratory | I |
| Theravance | pain | I |
| Telethon Institute for Gene Therapy | stem cell gene therapy | I & II |
| Affiris | Alzheimer's disease treatment vaccine | II |
| Nabi | nicotine vaccine | III |

* Two assets

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING INFORMATION

Under the safe harbor provisions of the US Private Securities Litigation Reform Act of 1995, the company cautions investors that any forward-looking statements or projections made by the company, including those made in this document, are subject to risks and uncertainties that may cause actual results to differ materially from those projected.

Continued development of commercially viable new products is critical to the Group's ability to replace sales of older products that decline upon expiration of exclusive rights, and to increase overall sales. Developing new products is a costly, lengthy and uncertain process. A new product candidate can fail at any stage of the process, and one or more late-stage product candidates could fail to receive regulatory approval.

New product candidates may appear promising in development but, after significant investments, fail to reach the market or have only limited commercial success as a result of efficacy or safety concerns, inability to obtain necessary regulatory approvals, difficulty or excessive costs to manufacture or infringement of patents or other intellectual property rights of others or inability to differentiate the product adequately from those with which it competes.

Other factors that may affect the Group's operations are described under 'Risk Factors' in the Operating and Financial Review and Prospects in the company's Annual Report on Form 20-F for 2010.

