# R&D Pipeline (May 2012)

## 1. Global Development

### (1) Filed

| Code No. Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| YM178 mirabegron | Beta 3 receptor agonist | Overactive bladder associated with symptoms of urgency, urinary frequency, and urge urinary incontinence | US Filed (Aug. 2011) Europe Filed (Aug. 2011) | Oral | In-house | |

### (2) Phase-lll / Phase-ll (1/3)

Stage in the most advanced territory

| Code No. Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| MDV3100 | Androgen antagonist | Prostate cancer | US Phase-III Europe Phase-III Japan Phase-III Asia Phase-III | Oral | Medivation | |
| | | Breast cancer | US Phase-I | | | |
| ASP1941 ipragliflozin | SGLT2 inhibitor | Type 2 diabetes | Japan Phase-III US Phase-II Europe Phase-II | Oral | In-house (co-development with Kotobuki) | |
| isavuconazole | Azole antifungal | Invasive aspergillosis | US/Europe Phase-III | Injection Oral | Basilea | |
| | | Candidemia / Invasive candidiasis | US/Europe Phase-III | | | |
| erlotinib (Tarceva) | HER1/EGFR tyrosine kinase inhibitor | Non-small cell lung cancer (First line for patients with EGFR mutation, adjuvant), Hepatocellular carcinoma | US Phase-III | Oral | In-house (OSI) | New indication |

(2) Phase-lll / Phase-ll (2/3)

Stage in the most advanced territory

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| ASP4130<br>tivozanib | Triple VEGF receptors inhibitor | Renal cell carcinoma | US/Europe Phase-III | Oral | AVEO | |
| | | Breast cancer, Colorectal cancer | US/Europe Phase-II | | | |
| ASP0113<br>(VCL-CB01) | DNA vaccine for cytomegalovirus | Cytomegalovirus reactivation in hematopoietic stem cell transplant recipients | US/Europe Phase-III | Injection | Vical | |
| | | Cytomegalovirus infection or reactivation in solid organ transplant recipients | US/Europe Phase-II | | | |
| YM905<br>solifenacin | Muscarine $M_3$ receptor antagonist | Neurogenic detrusor overactivity and idiopathic overactive bladder in pediatric patients | US/Europe Phase-III | Oral | In-house | New indication |
| ASP7487<br>(OSI-906)<br>linsitinib | IGF-1R/IR tyrosine kinase inhibitor | Ovarian cancer,<br>Non-small cell lung cancer | US Phase-II | Oral | In-house<br>(OSI) | |
| YM155 | Survivin suppressant | Breast cancer,<br>Non-Hodgkin's lymphoma | US Phase-II<br>Europe Phase-II<br>Japan Phase-I | Injection | In-house | |
| AC220<br>quizartinib | FLT3 kinase inhibitor | Acute myeloid leukemia | US Phase-II<br>Europe Phase-II | Oral | Ambit | |
| ASP1517<br>(FG-4592) | HIF stabilizer | Renal anemia | Europe Phase-II<br>Japan Phase-I | Oral | FibroGen | |
| YM311<br>(FG-2216) | HIF stabilizer | Renal anemia | Europe Phase-II<br>Japan Phase-I | Oral | FibroGen | |

(2) Phase-lll / Phase-ll (3/3)

Stage in the most advanced territory

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| AGS-1C4D4 | Antibody<br>(Prostate stem cell antigen) | Pancreatic cancer | US/Europe Phase-II | Injection | In-house<br>(Agensys) | |
| ASP015K | JAK inhibitor | Rheumatoid arthritis | US/Europe Phase-II<br>Japan Phase-II | Oral | In-house | |
| | | Prevention of organ transplant rejection | US Phase-II | | | |
| ASKP1240 | Anti-CD40 antagonist | Prevention of organ transplant rejection | US Phase-II<br>Japan Phase-I | Injection | Kyowa Hakko Kirin | |
| OSI-027 | mTOR kinase inhibitor | Renal cell cancer | US Phase-II | Oral | In-house<br>(OSI) | |
| PSN821 | GPR119 agonist | Type 2 diabetes, Obesity | Europe Phase-II | Oral | In-house<br>(OSI) | |
| ASP8597<br>diannexin | Inhibition of monocyte and platelet binding to phosphatidylserine | Prevention of delayed graft function in kidney transplantation | US Phase-II | Injection | Alavita | |
| EB178<br>solifenacin/<br>mirabegron | Concomitant use of solifenacin and mirabegron | Urinary frequency, urinary incontinence or urgency associated with overactive bladder | Europe Phase-II | Oral | In-house | |
| ASP3652 | Inhibition of afferent nerve activity | Chronic prostatitis /<br>Chronic pelvic pain syndrome | Europe Phase-II<br>Japan Phase-I | Oral | In-house | |
| | | Bladder pain syndrome /<br>Interstitial cystitis | Europe Phase-II | | | |

2. Local Development: Japan

(1) Approved

| Code No.<br>Generic | Product Name<br>(Approval Date) | Classification | Target Disease | Area | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|---|
| ASP8825<br>(XP13512)<br>gabapentin enacarbil | Regnite<br>(Jan. 2012) | Prodrug of gabapentin | Moderate-to-severe primary restless legs syndrome | Japan | Oral | XenoPort | |
| amoxicillin | Sawacillin<br>(Feb. 2012) | Penicillin antibiotic | Changes in maximum pediatric dosages for infections excluding helicobacter pylori infection | Japan | Oral | In-house | Additional dosage and administration |
| ASP1585<br>(AMG223)<br>bixalomer | Kiklin<br>(Mar. 2012) | Amine-functional polymer | Hyperphosphatemia in patients on dialysis with chronic kidney disease | Japan | Oral | Ilypsa/Amgen | |

(2) Filed

The most advanced stage

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| YM443<br>acotiamide | Acetylcholine esterase inhibitor | Functional dyspepsia | Japan Filed<br>(Sep. 2010) | Oral | Zeria | |
| ASP3550<br>degarelix | GnRH receptor antagonist | Prostate cancer<br>(One-month formulation) | Japan Filed<br>(Oct. 2010) | Injection | Ferring | |
| | | Prostate cancer<br>(Three-month formulation) | Japan Phase-II | | | New formulation |
| certolizumab<br>pegol | PEGylated anti-tumor necrosis factor-alpha antibody | Rheumatoid arthritis in patients who respond insufficiently to current therapies | Japan Filed<br>(Jan. 2012) | Injection | UCB | |
| | | Methotrexate-naive rhumatoid arthritis | Japan Phase-III | | | New indication |

(3) Phase-lll / Phase-ll

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| YM533<br>beraprost sodium | Prostacyclin receptor stimulator | Chronic renal failure<br>(primary, nephrosclerosis) | Japan/Asia Phase-III | Oral | Toray | New indication<br>New formulation |
| FK949E<br>quetiapine | Serotonin/dopamine antagonist | Depressive episode<br>in bipolar disorders | Japan Phase-III | Oral | AstraZeneca | New indication<br>New formulation |
| | | Major depressive disorder | Japan Phase-II | | | |
| YM060<br>ramosetron | 5-HT3 receptor antagonist | Irritable bowel syndrome<br>Female patients | Japan Phase-II | Oral | In-house | New indication |
| | | Irritable bowel syndrome<br>(Orally-disintegrating tablet) | Japan<br>Bio-equivalent study | | | New formulation |
| ASP7373 | Influenza vaccine | Prophylaxis of H5N1 influenza | Japan Phase-II | Injection | UMN Pharma | |
| ASP7374 | Influenza vaccine | Prophylaxis of seasonal influenza | Japan Phase-II | Injection | UMN Pharma | |
| ASP0456<br>linaclotide | Guanylate cyclase type-C receptor agonist | Irritable bowel syndrome | Japan Phase-II | Oral | Ironwood | |

3. Local Development: Europe

(1) Approved

| Code No.<br>Generic Name | Product Name<br>(Approval Date) | Classification | Target Disease | Area | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|---|
| fidaxomicin | DIFICLIR<br>(Dec. 2011) | Macrocyclic antibiotic | Treatment of clostridium difficile infection | Europe | Oral | Optimer | |

(2) Filed

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| EC905<br>solifenacin/<br>tamsulosin | Fixed dose combination of solifenacin and tamsulosin | Lower urinary tract symptoms associated with benign prostatic hyperplasia,<br>with storage symptoms | Europe Filed<br>(Mar. 2012) | Oral | In-house | |

(3) Phase-lll / Phase-ll

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| NGX-4010<br>capsaicin | TRPV1 agonist | Peripheral diabetic neuropathy | Europe Phase-III | Patch | NeurogesX | New indication |

4. Phase-I

| Code No.<br>Generic Name | Target Disease | Dosage Form | Origin |
|---|---|---|---|
| AGS-16M8F/<br>AGS-16C3F | Cancer (ADC technology) | Injection | In-house (Agensys) |
| ASG-5ME | Cancer (ADC technology) | Injection | In-house (Agensys)<br>(co-development with Seattle Genetics) |
| ASP7035 | Nocturia | Oral | In-house |
| ASP0777 | Alzheimer's disease [Dementia] | Oral | In-house |
| ASP5034 | Type 2 diabetes | Oral | In-house |
| ASP1707 | Prostate cancer, Endometriosis | Oral | In-house |
| ASP0306 | Lower urinary tract symptoms<br>associated with benign prostatic hyperplasia | Oral | In-house |
| ASP4058 | Multiple sclerosis | Oral | In-house |
| ASP4901<br>(AKP-002) | Lower urinary tract symptoms<br>associated with benign prostatic hyperplasia | Oral | ASKA |
| ASP8477 | Neuropathic pain | Oral | In-house |
| ASP2408 | Rheumatoid arthritis | Injection | In-house (Perseid) |
| ASP3026 | Cancer | Oral | In-house |
| ASP9521 | Prostate cancer | Oral | In-house |
| ASG-22M6E | Cancer (ADC technology) | Injection | In-house (Agensys)<br>(co-development with Seattle Genetics) |
| ASP7147 | Irritable bowel syndrome | Oral | In-house |
| ASP9226 | Neuropathic pain | Oral | In-house |
| ASP9603 | Prostate cancer | Oral | In-house |
| ASP7991 | Secondary hyperparathyroidism | Oral | In-house |
| ASP2409 | Prevention of organ transplant rejection | Injection | In-house (Perseid) |
| ASP6973 | Osteoarthritis, Chronic low back pain | Oral | In-house |

<Changes from the Previous Announcement on February 1, 2012>

-YM177: Deleted the description of YM177 for the new indication approved in Japan in December 2011.

| Code No.<br>Generic Name | Product Name<br>(Approval Date) | Classification | Target Disease | Area | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|---|
| YM177<br>celecoxib | Celecox<br>(Dec. 2011) | Cyclooxygenase-II inhibitor | Anti-inflammatory and analgesic effects in post-operation, post-trauma, and post-tooth extraction | Japan | Oral | Pfizer | New indication |

Approved

-Amoxicillin: Approved for changes in maximum pediatric dosages in Japan in February 2012.

| Code No.<br>Generic Name | Product Name<br>(Approval Date) | Classification | Target Disease | Area | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|---|
| amoxicillin | Sawacillin<br>(Feb. 2012) | Penicillin antibiotic | Changes in maximum pediatric dosages for infections excluding helicobacter pylori infection | Japan | Oral | In-house | Additional dosage and administration |

-ASP1585: Approved in Japan in March 2012.

| Code No.<br>Generic Name | Product Name<br>(Approval Date) | Classification | Target Disease | Area | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|---|
| ASP1585<br>(AMG223)<br>bixalomer | Kiklin<br>(Mar. 2012) | Amine-functional polymer | Hyperphosphatemia in patients on dialysis with chronic kidney disease | Japan | Oral | Ilypsa/<br>Amgen | |

## Filed (The most advanced stage)

-Certolizumab pegol: Newly added because of license agreement with UCB in Japan.

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| certolizumab pegol | PEGylated anti-tumor necrosis factor-alpha antibody | Rheumatoid arthritis in patients who respond insufficiently to current therapies | Japan Filed (Jan. 2012) | Injection | UCB | |
| | | Methotrexate-naive rhumatoid arthritis | Japan Phase-III | | | New indication |

-EC905: Filed in Europe in March 2012.

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| EC905 solifenacin/ tamsulosin | Fixed dose combination of solifenacin and tamsulosin | Lower urinary tract symptoms associated with benign prostatic hyperplasia, with storage symptoms | Europe Filed (Mar. 2012) | Oral | In-house | |

## Phase-III / Phase-II

-MDV3100: Entered into phase-I for breast cancer in the US. (Added underlined part.)

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| MDV3100 | Androgen antagonist | Prostate cancer | US Phase-III<br>Europe Phase-III<br>Japan Phase-III<br>Asia Phase-III | Oral | Medivation | |
| | | <u>Breast cancer</u> | <u>US Phase-I</u> | | | |

-ASP7487 (OSI-906): Deleted adrenocortical carcinoma from the target disease because we discontinued the development in it, which was in phase-III in the US.

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| ASP7487<br>(OSI-906)<br>linsitinib | IGF-1R/IR tyrosine kinase inhibitor | ~~Adrenocortical carcinoma~~ | ~~US Phase-III~~ | Oral | In-house<br>(OSI) | |
| | | Ovarian cancer,<br>Non-small cell lung cancer | US Phase-II | | | |

-ASP0456: Entered into phase-II in Japan.

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| ASP0456<br>linaclotide | Guanylate cyclase type-C receptor agonist | Irritable bowel syndrome | Japan Phase-II | Oral | Ironwood | |

-NGX-4010: Added the description because we are conducting phase-III in Europe.

| Code No.<br>Generic Name | Classification | Target Disease | Area / Phase | Dosage Form | Origin | Remarks |
|---|---|---|---|---|---|---|
| NGX-4010<br>capsaicin | TRPV1 agonist | Peripheral diabetic neuropathy | Europe Phase-III | Patch | NeurogesX | New indication |

## Phase-I

-AGS-16C3F: Written together with AGS-16M8F. AGS-16C3F is the CHO version of AGS-16M8F (hybridoma version) and it is entering into phase-I. (Added underlined part.)

| Code No.<br>Generic Name | Target Disease | Dosage Form | Origin |
|---|---|---|---|
| AGS-16M8F/<br>AGS-16C3F | Cancer (ADC technology) | Injection | In-house (Agensys) |

-Added ASP6973 [Osteoarthritis, Chronic low back pain] to the phase-I list.

## Deleted from the list

-ASP3291 [Ulcerative colitis] in phase-I: Deleted from the list because we decided not to develop it by ourselves. The asset of ASP3291 was transferred to another company as a part of activities of "Multi-Track R&D".