

Oncology Drugs in the Pipeline

HEM Onc TODAY presents the most recent information about oncology drugs in the pipeline. Drugs listed here are in phase 2 or phase 3 development for a variety of indications. Clinicians can use this chart as a quick reference to learn about the status of those drugs that may be clinically significant to their practice.

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
131I-chTNT-1/B mAb (Cotara, Peregrine Pharmaceuticals)	glioblastoma	phase 2
18F-fluorothymidine (Merck)	breast cancer diagnosis	phase 2
A6 (Angstrom Pharmaceuticals)	ovarian cancer	phase 2
abagovomab (Menarini)	ovarian cancer	phase 3
abexinostat (Pharmacyclics)	follicular lymphoma, mantle cell lymphoma	phase 2
ABI-008 (Celgene)	prostate cancer	phase 2
ABIO-0501 (Abiogen Pharma)	chronic myeloid leukemia	phase 2
abiraterone (Zytiga, Janssen Biotech)	breast cancer/prostate cancer	phase 2/phase 3
ABT-888 (Abbott Laboratories)	breast cancer, colorectal cancer, fallopian tube cancer, lymphoma, melanoma, non-small cell lung cancer, ovarian cancer	phase 2
ACE-041 (Acceleron Pharma)	head and neck cancers	phase 2
acolbifene (EndoCeutics)	breast cancer	phase 2
ACY-1215 (Acetylon Pharmaceuticals)	myeloma	phase 2
ado-trastuzumab emtansine (Kadcyla, Genentech)	first-line and third-line HER-2-positive breast cancer	phase 3
ADX5-HPV(Advaxis)	cervical cancer	phase 2
AE37 peptide vaccine (Antigen Express)	breast cancer	phase 2
AEE788 (Novartis Pharmaceuticals)	glioblastoma	phase 2
AEG35156 (Aegera Therapeutics)	acute myelogenous leukemia, chronic lymphocytic leukemia, B-cell lymphoma	phase 2
AEZS-108 (Aeterna Zentaris)	bladder cancer, endometrial cancer, ovarian cancer, prostate cancer	phase 2
afatinib (Boehringer Ingelheim) <small>READ PERSPECTIVE on this drug from Tobenna Nwizu, MD, on page 76.</small>	glioblastoma/breast cancer, non-small cell lung cancer, head and neck cancers	phase 2/phase 3
afimoxifene (Ascend Therapeutics)	breast cancer prevention	phase 2
aflibercept (Zaltrap; Regeneron Pharmaceuticals, Sanofi)	prostate cancer	phase 3
AFP464 (Kirax)	breast cancer	phase 2
AGS-003 (Argos Therapeutics)	renal cancer	phase 2
AGS-005 (Argos Therapeutics)	chronic lymphocytic leukemia	phase 2
albumin-bound paclitaxel (Abraxane, Celgene)	bladder cancer, breast cancer, ovarian cancer/pancreatic cancer, skin cancer, non-small cell lung cancer	phase 2/phase 3
algenpantucel-L (HyperAcute Pancreas, NewLink Genetics)	pancreatic cancer	phase 3
AlloStim (Immunovative Therapies)	hematologic malignancies	phase 2
ALT-801 (Altor BioScience)	melanoma, myeloma, urogenital cancer	phase 2
AME-133v (Mentrik Biotech)	non-Hodgkin's lymphoma	phase 2
AMG888/U3-1287 (Amgen/Daiichi Sankyo)	non-small cell lung cancer	phase 2
aminopterin (Syntrix Biosystems)	acute lymphoblastic leukemia	phase 2
amonafide (Quinamed, Cephalon)	breast cancer, ovarian cancer, prostate cancer	phase 2
amrubicin (Celgene)	breast cancer/small cell lung cancer	phase 2/phase 3
amuvatinib (Astex Pharmaceuticals)	small cell lung cancer	phase 2

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anti-CD22 antibody-drug conjugate (Genentech)	diffuse large B-cell lymphoma, non-Hodgkin's lymphoma	phase 2
anti-CD79b antibody-drug conjugate (Genentech)	diffuse large B-cell lymphoma, non-Hodgkin's lymphoma	phase 2
anti-EGFL7 MAb (Genentech)	colorectal cancer, non-small cell lung cancer	phase 2
anti-Her3/EGFR DAF MAb (Genentech)	colorectal cancer, head and neck cancers	phase 2
anti-MUC1 mAb (Quest PharmaTech)	pancreatic cancer	phase 2
anti-PSCA mAb (Agensys/Astellas)	pancreatic cancer	phase 2
AP1903 (Bellicum Pharmaceuticals)	prostate cancer	phase 2
AP5346 (Access Pharmaceuticals)	head and neck cancers	phase 2
apaziquone (Eoquin, Allergan)	bladder cancer	phase 3
APC-100 (Adamis Pharmaceuticals)	prostate cancer	phase 2
APN301 (Apeiron Biologics)	melanoma, pediatric neuroblastoma	phase 2
apricoxib (Tragara Pharmaceuticals)	non-small cell lung cancer, pancreatic cancer	phase 2
AR-42 (Arno Therapeutics)	chronic lymphocytic leukemia, lymphoma, multiple myeloma	phase 2
AR-67 (Arno Therapeutics)	glioblastoma, myelodysplastic syndromes	phase 2
ARC-100 (Archer Biosciences)	breast cancer, glioblastoma, melanoma, neuroblastoma, prostate cancer	phase 2
ARN-509 (Aragon Pharmaceuticals)	prostate cancer	phase 2
ARRY-162 (Array BioPharma)	melanoma	phase 2
ARRY-520 (Array BioPharma)	acute myelogenous leukemia, myeloma	phase 2
ascorbic acid/menadione (Apatone, IC-MedTech)	prostate cancer	phase 2
astuprotimut-R (GlaxoSmithKline)	non-small cell lung cancer, melanoma	phase 3
AT-101 (Ascenta Therapeutics)	chronic lymphocytic leukemia, esophageal cancer, glioblastoma, non-Hodgkin's lymphoma, non-small cell lung cancer, prostate cancer	phase 2
AT13387 (Astex Pharmaceuticals)	gastrointestinal stromal tumors	phase 2
AT7519 (Astex Pharmaceuticals)	chronic lymphocytic leukemia, mantle cell lymphoma, myeloma	phase 2
AT9283 (Astex Pharmaceuticals)	acute myelogenous leukemia, myeloma	phase 2
autologous stem cell therapy (California Stem Cells)	melanoma	phase 2
AUY922 (Novartis)	breast cancer, gastrointestinal stromal tumors, myeloma, non-small cell lung cancer	phase 2
AVX701 (AlphaVax)	colorectal cancer prevention	phase 2
axitinib (Inlyta, Pfizer)	liver cancer, thyroid cancer/renal cell carcinoma	phase 2/phase 3
azacitidine (Vidaza, Celgene)	solid tumors/acute myelogenous leukemia, lymphoma	phase 2/phase 3
AZD8931 (AstraZeneca)	breast cancer	phase 2
bafetinib (CytRx)	chronic lymphocytic leukemia, prostate cancer	phase 2
bavituximab (Peregrine Pharmaceuticals)	liver cancer, non-small cell lung cancer, pancreatic cancer	phase 2
BAY 80-6946 (Bayer Healthcare)	non-Hodgkin's lymphoma	phase 2
BAY 86-5044 (Bayer HealthCare)	breast cancer	phase 2
BAY 86-9766 (Ardea Biosciences)	liver cancer, pancreatic cancer	phase 2
BC-819 (BioCancell Therapeutics)	bladder cancer, ovarian cancer, pancreatic cancer	phase 2

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belagenpumatucel-L (Lucanix, NovaRx)	non-small cell lung cancer	phase 3
belinostat (Spectrum Pharmaceuticals)	acute myelogenous leukemia, colorectal cancer, liver cancer, mesothelioma, non-small cell lung cancer, ovarian cancer, peripheral B-cell lymphoma, peripheral T-cell lymphoma, peritoneal cancer, thymoma	phase 2
bendamustine (Treanda, Cephalon)	acute lymphoblastic leukemia, acute myelogenous leukemia, mantle cell lymphoma, multiple myeloma/non-Hodgkin's lymphoma	phase 2/phase 3
bevacizumab (Avastin, Genentech) <small>READ PERSPECTIVE on this drug from Maurie Markman, MD, on page 75.</small>	breast cancer, colorectal cancer, glioblastoma, high-risk carcinoid tumor, non-small cell lung cancer, ovarian cancer	phase 3
BHQ880 (Novartis)	myeloma	phase 2
BI-695500 (Boehringer Ingelheim)	non-Hodgkin's lymphoma	phase 3
BI-811283 (Boehringer Ingelheim)	acute myelogenous leukemia	phase 2
BIIB 2024 (Biogen Idec)	breast cancer, gastrointestinal stromal tumors	phase 2
BiovaxID (BioVest International)	mantle cell lymphoma/follicular lymphoma	phase 2/phase 3
birinapant (TetraLogic)	acute myelogenous leukemia	phase 2
BIW-8962 (Kyowa Hakko Kirin Pharma)	multiple myeloma	phase 2
BKM120 (Novartis)	breast cancer, endometrial cancer, glioblastoma, non-small cell lung cancer, non-Hodgkin's lymphoma, urogenital cancer	phase 2
blinatumomab (Amgen)	acute myelogenous leukemia, non-Hodgkin's lymphoma	phase 2
BNC105 (Bionomics)	kidney cancer	phase 2
BNP1350 (Karenitecin, BioNumerik Pharmaceuticals)	non-small cell lung cancer/ovarian cancer	phase 2/phase 3
bortezomib (Velcade, Millennium)	adenocarcinoma, diffuse large B-cell lymphoma, T-cell prolymphocytic leukemia/mantle cell lymphoma, non-Hodgkin's B-cell lymphoma	phase 2/phase 3
bosutinib (Pfizer)	chronic myeloid leukemia	phase 3
BPX-101 (Bellicum Pharmaceuticals)	prostate cancer	phase 2
breast cancer vaccine (Quantum Immunologics)	breast cancer	phase 2
brentuximab vedotin (Adcetris; Millennium Pharmaceuticals, Seattle Genetics)	CD30-positive hematologic malignancies, non-Hodgkin's lymphoma/Hodgkin's lymphoma, T-cell lymphoma	phase 2/phase 3
brivanib (Bristol-Myers Squibb)	colorectal cancer, sarcoma / liver cancer	phase 2/phase 3
c31510 (Cytotech)	basal cell carcinoma, squamous cell carcinoma	phase 2
cabozantinib (Exelixis)	breast cancer, non-small cell lung cancer, ovarian cancer/castration-resistant prostate cancer, thyroid cancer	phase 2/phase 3
calaspargase pegol (Sigma-Tau Pharmaceuticals)	acute lymphoblastic leukemia	phase 3
cancer vaccine (MabVax Therapeutics)	prostate cancer	phase 2
cancer vaccine E75 (NeuVax, Galena Biopharma)	prostate cancer/breast cancer	phase 2/phase 3
canfosfamide (Telcyta, Telik)	diffuse large B-cell lymphoma, mantle cell lymphoma, non-Hodgkin's lymphoma/non-small cell lung cancer, ovarian cancer	phase 2/phase 3
capecitabine (Xeloda, Genentech)	biliary cancer, esophageal cancer	phase 2
carfilzomib (Kyprolis, Onyx Pharmaceuticals)	myeloma	phase 3
carlecortemcel-L (Gamida Cell)	hematologic malignancies	phase 3
catumaxomab (Fresenius Biotech)	malignant ascites, ovarian cancer	phase 2
CB-10-01 cancer vaccine (Cosmo Pharmaceuticals)	melanoma	phase 2
CB3304 (Cougar Biotechnology)	multiple myeloma	phase 2
CBLC102 (Cleveland BioLabs/Incuron)	prostate cancer	phase 2

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CBP-501 (CanBas)	mesothelioma, non-small cell lung cancer	phase 2
CC-223 (Celgene)	solid tumors	phase 2
CC-486 (Celgene)	acute myelogenous lymphoma, myelodysplastic syndromes	phase 2
cenersen (Eleos)	acute myelogenous leukemia	phase 2
CEP-9722 (Cephalon)	non-small cell lung cancer	phase 2
cetuximab (Erbix; Bristol-Myers Squibb, Eli Lilly)	colorectal cancer, gastric cancer	phase 3
ch.14.18 mAb (United Therapeutics)	pediatric neuroblastoma	phase 3
chk1 inhibitor (Eli Lilly)	non-small cell lung cancer, pancreatic cancer	phase 2
cilengitide (EMD Serono)	glioblastoma, prostate cancer	phase 3
cixutumumab (Eli Lilly)	liver cancer, non-small cell lung cancer	phase 2
CLL immunotherapeutic vaccine (MaxCyte)	chronic lymphocytic leukemia	phase 2
clodronic acid (Bayer HealthCare)	bone metastases	phase 3
clofarabine injection (Clolar, Genzyme)	acute myelogenous leukemia	phase 3
CLR1404-I-124 (Novelos Therapeutics)	non-small cell lung cancer	phase 2
CLR1404-I-131 (Novelos Therapeutics)	non-small cell lung cancer	phase 2
CNDO-109 (Coronado Biosciences)	acute myelogenous leukemia	phase 2
CO-101 (Clovis Oncology)	pancreatic cancer	phase 2
CO-1686 (Clovis Oncology)	non-small cell lung cancer	phase 2
coxsackievirus A21 (Cavatak, Viralytics)	melanoma	phase 2
CP-18770 (Cephalon)	multiple myeloma	phase 2
CPI-613 (Cornerstone Pharmaceuticals)	pancreatic cancer	phase 2
CPX-1 (Celator Pharmaceuticals)	colorectal cancer	phase 2
CPX-351 (Celator)	acute myelogenous leukemia	phase 3
crenolanib (AROG Pharmaceuticals)	gastrointestinal stromal tumors, glioma, acute myelogenous leukemia	phase 2
crizotinib (Xalkori, Pfizer)	non-small cell lung cancer	phase 3
CRS-207 (Aduro BioTech)	pancreatic cancer	phase 2
CT-011 (CureTech)	acute myelogenous leukemia, colorectal cancer, diffuse large B-cell lymphoma, follicular lymphoma	phase 2
CTL019 (Novartis/University of Pennsylvania)	chronic lymphocytic leukemia	phase 2
custirsen (OncoGenex/Teva)	non-small cell lung cancer/prostate cancer	phase 2/phase 3
CV-301 (BN ImmunoTherapeutics)	breast cancer	phase 2
Cvac (Prima BioMed)	ovarian cancer	phase 3
CVX 060 (Pfizer)	renal cell carcinoma	phase 2
cytarabine/daunorubicin (CPX-351, Celator Pharmaceuticals)	acute myelogenous leukemia	phase 2
D-1MT (NewLink Genetics)	breast cancer	phase 2
dabrafenib (GSK2118436, GlaxoSmithKline)	BRAF mutation-positive disease, brain metastases from melanoma, non-small cell lung cancer/melanoma	phase 2/phase 3
dacomitinib (Pfizer)	non-small cell lung cancer	phase 3

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Generic name (Brand name, Manufacturer)	Indication(s)	Development status
dalotuzumab (Merck)	breast cancer, lung cancer, neuroendocrine tumors, pancreatic cancer	phase 2
danusertib (Nerviano Medical Sciences)	chronic myeloid leukemia	phase 2
daratumumab (Genmab)	multiple myeloma	phase 2
darbepoetin alfa (Amgen)	myelodysplastic syndromes	phase 3
darinaparsin (ZIO-101, Ziopharm Oncology)	liver cancer, T-cell lymphoma, multiple myeloma	phase 2
dasatinib (Sprycel, Bristol-Myers Squibb) <small>READ PERSPECTIVE on this drug from Manmeet Ahluwalia, MD, FACP, on page 76.</small>	breast cancer, glioblastoma, leukemia, pancreatic cancer/prostate cancer	phase 2/phase 3
DCC-2036 (Deciphera Pharmaceuticals)	acute lymphoblastic leukemia, chronic myeloid leukemia	phase 2
DCVax-Brain (Northwest Biotherapeutics)	glioblastoma	phase 2
decitabine (Dacogen, Eisai)	acute myelogenous leukemia	phase 3
degarelix (Firmagon, Ferring)	prostate cancer	phase 3
delanzomib (Cephalon)	myeloma	phase 2
denileukin diftitox (Ontak, Eisai)	melanoma	phase 2
denosumab (Xgeva, Amgen)	giant cell tumor of bone/prevention of bone metastases, bone damage in patients with multiple myeloma	phase 2/phase 3
dimesna (Tavocept, BioNumerik Pharmaceuticals)	lung cancer	phase 3
dinaciclib (Merck)	chronic lymphocytic leukemia	phase 3
DN24-02 dendritic cell vaccine (Dendreon)	urogenital cancer	phase 2
dovitinib (TKI258, Novartis)	breast cancer, endometrial cancer, glioblastoma, melanoma, multiple myeloma, prostate cancer, urothelial cancer/kidney cancer	phase 2/phase 3
doxorubicin-eluting beads (DC Bead; Bayer HealthCare, Bio-compatibles)	liver cancer	phase 2
doxorubicin liposomal (Myocet, Sopherion Therapeutics)	breast cancer	phase 3
doxorubicin liposomal (ThermoDox)	breast cancer, colorectal cancer / liver cancer	phase 2/phase 3
E7050 (Eisai)	gastric cancer, glioblastoma, head and neck cancers, liver cancer, melanoma	phase 2
E7080 (Eisai)	glioma, melanoma / thyroid cancer	phase 2/phase 3
E7820 (Eisai)	colorectal cancer	phase 2
E7850 (Eisai)	ovarian cancer, prostate cancer, thyroid cancer	phase 2
EC20 (Endocyte)	non-small cell lung cancer/ovarian cancer	phase 2/phase 3
EC145 (Endocyte/Merck)	non-small cell lung cancer/ovarian cancer	phase 2/phase 3
ecromeximab (Life Science Pharmaceuticals)	melanoma	phase 2
efatutazone (Daiichi Sankyo)	colorectal cancer, non-small cell lung cancer, thyroid cancer	phase 2
EGEN-001 (Egen)	colorectal cancer, fallopian tube cancer, ovarian cancer, peritoneal cancer	phase 2
elacytarabine (Elacyt, Clavis Pharma)	acute myelogenous leukemia	phase 3
elagolix (Abbott Laboratories)	uterine leiomyoma	phase 2
elesclomol (Synta)	non-small cell lung cancer, ovarian cancer	phase 2
elotuzumab (Bristol-Myers Squibb)	multiple myeloma	phase 3
eltrombopag (Promacta, GlaxoSmithKline)	acute myelogenous leukemia, myelodysplastic syndromes	phase 2

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EMD-525797 (EMD Serono)	prostate cancer	phase 3
emepepimut-S (EMD Serono/Oncothyreon)	prostate cancer / non-small cell lung cancer	phase 2/phase 3
EN3488 (Endo Pharmaceuticals)	bladder cancer	phase 3
encapsulated cell therapy (Rogosin Institute)	colorectal cancer, pancreatic cancer, prostate cancer	phase 2
eniluracil (Adherex Technologies)	breast cancer	phase 2
ENMD-2076 (EntreMed)	ovarian cancer	phase 2
entinostat (Syndax Pharmaceuticals)	breast cancer, colorectal cancer, Hodgkin's lymphoma, kidney cancer, leukemia, non-small cell lung cancer	phase 2
enzastaurin (Eli Lilly)	diffuse large B-cell lymphoma	phase 3
EPO-806 (Novartis)	brain metastases from lung cancer, prostate cancer	phase 2
epratuzumab (Immunomedics)	acute lymphoblastic leukemia, diffuse large B-cell lymphoma, follicular lymphoma	phase 2
epratuzumab Y-90 (Immunomedics)	diffuse large B-cell lymphoma, non-Hodgkin's lymphoma	phase 2
eribulin (Halaven, Eisai)	prostate cancer/non-small cell lung cancer, sarcoma	phase 2/phase 3
erlotinib (Tarceva, Genentech)	brain metastases, breast cancer, ependymoma (children), glioblastoma, gynecologic cancers, head and neck cancers, myelodysplastic syndrome/liver cancer, non-small cell lung cancer	phase 2/phase 3
etirinotecan pegol (Nektar Therapeutics)	platinum-resistant ovarian cancer/breast cancer, colorectal cancer	phase 2/phase 3
everolimus (Afinitor, Novartis)	kidney cancer, diffuse large B-cell lymphoma, mantle cell lymphoma/HER-2-positive breast cancer	phase 2/phase 3
ezatiostat (Telintra)	myelodysplastic syndromes	phase 3
EZN-2208 (Enzon Pharmaceuticals)	breast cancer, colorectal cancer	phase 2
Fang Vaccine (Gradalis)	colorectal cancer, melanoma, ovarian cancer	phase 2
FG-3019 (FibroGen)	pancreatic cancer	phase 2
ficlatuzumab (AVEO)	non-small cell lung cancer	phase 2
folate binding protein (E39) vaccine (Galena Biopharma)	endometrial cancer, ovarian cancer	phase 2
foretinib (GlaxoSmithKline)	head and neck cancers, kidney cancer, non-small cell lung cancer	phase 2
forodesine (BioCryst Pharmaceuticals)	chronic lymphocytic leukemia, cutaneous T-cell lymphoma	phase 2
fosbretabulin (Zybrestat, OXiGENE)	non-small cell lung cancer, ovarian cancer	phase 2
fostamatinib (AstraZeneca/Rigel Pharmaceuticals)	hematologic malignancies	phase 2
fulvestrant (Faslodex, AstraZeneca)	breast cancer	phase 3
G-100 prophage cancer vaccine (Agenus)	glioma	phase 2
G-200 prophage cancer vaccine (Agenus)	glioma	phase 2
galiximab (Biogen Idec)	non-Hodgkin's lymphoma	phase 2
ganetespib (Synta Pharmaceuticals)	acute lymphoblastic leukemia, acute myelogenous leukemia, breast cancer, chronic myeloid leukemia, colorectal cancer, esophageal cancer, gastric cancer, gastrointestinal stromal tumors, liver cancer, melanoma, pancreatic cancer, prostate cancer/non-small cell lung cancer	phase 2/phase 3
ganitumab (Amgen)	breast cancer, colorectal cancer, sarcoma, small cell lung cancer/pancreatic cancer	phase 2/phase 3
GDC-0941 (Genentech)	breast cancer, non-small cell lung cancer	phase 2
GDC-0973 (Genentech)	melanoma	phase 3

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GDC-0980 (Genentech) <small>READ PERSPECTIVE on this drug from James P. Stevenson, MD, on page 77.</small>	breast cancer, non-Hodgkin's lymphoma, endometrial cancer, renal cell carcinoma	phase 2
gefitinib (Iressa, AstraZeneca)	non-small cell lung cancer	phase 3
GI-4000 (Globelimmune)	colorectal cancer, pancreatic cancer	phase 2
girentuximab (Rencarex, Willex)	clear cell renal cell carcinoma	phase 3
girentuximab I-124 (Redectane, Willex)	renal cancer	phase 3
GL-0817 (GliKnik)	multiple myeloma	phase 2
glembatumumab vedotin (CDX-011, Celldex Therapeutics)	breast cancer, melanoma	phase 2
GliAtak (Advantagene)	glioma	phase 2
glufosfamide (Eleison Pharmaceuticals)	pancreatic cancer	phase 3
GMB-Vax (Activartis Biotech)	glioblastoma	phase 2
GM-CT-01 (Galectin Therapeutics)	colorectal cancer	phase 2
golnerminogene pradenovec (TNFerade, GenVec)	esophageal cancer, head and neck cancers, melanoma	phase 2
GRN1005 (GlaxoSmithKline)	brain metastases	phase 2
GRNVAC1 (Argos Therapeutics)	acute myelogenous leukemia, prostate cancer	phase 2
GSK2110183 (GlaxoSmithKline)	leukemia, multiple myeloma, ovarian cancer	phase 2
GSK2130579A (GlaxoSmithKline)	acute myelogenous leukemia	phase 2
GSK2302024A (GlaxoSmithKline)	breast cancer	phase 2
GS-6624 (Gilead Sciences)	colorectal cancer, pancreatic cancer	phase 2
GTx-758 (GTx)	prostate cancer	phase 2
GVAX Leukemia (BioSante Pharmaceuticals)	acute myelogenous leukemia, chronic myeloid leukemia	phase 2
GVAX Myeloma (BioSante Pharmaceuticals)	multiple myeloma	phase 2
GVAX Pancreatic (BioSante Pharmaceuticals/Aduro BioTech)	pancreatic cancer	phase 2
GVAX Prostate (BioSante Pharmaceuticals/Aduro BioTech)	prostate cancer	phase 3
HE3235 (Harbor Therapeutics)	prostate cancer	phase 2
HER-2 antigen-specific cancer immunotherapeutic (GlaxoSmithKline)	breast cancer	phase 2
histamine dihydrochloride injection (Ceplene, EpiCept)	acute myelogenous leukemia	phase 3
HuM195-Bi-213 (Actinium Pharmaceuticals)	acute myelogenous leukemia	phase 2
I-131 metaiodobenzylguanidine (Azedra, Molecular Insights Pharmaceuticals)	paraganglioma, pediatric neuroblastoma, pheochromocytoma	phase 2
ibritumomab tiuxetan (Zevalin, Spectrum Pharmaceuticals)	mantle cell lymphoma/diffuse large B-cell lymphoma	phase 2/phase 3
ibrutinib (Janssen Biotech/Pharmacyclics) <small>READ PERSPECTIVE on this drug from Mitchell Smith, MD, PhD, on page 77.</small>	diffuse large B-cell lymphoma, myeloma/chronic lymphocytic leukemia, mantle cell lymphoma	phase 2/phase 3
ICT-107 (ImmunoCellular Therapeutics)	glioblastoma	phase 2
icrucumab (LY3012212/IMC-18F1, Eli Lilly)	bladder cancer, breast cancer, colorectal cancer	phase 2
idelalisib (GS-1101, Gilead Sciences)	non-Hodgkin's lymphoma, chronic lymphocytic leukemia	phase 3
IDM-2101 (Biotech Synergy)	non-small cell lung cancer	phase 2

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IMA901 (Immatics Biotechnologies)	renal cancer	phase 3
imatinib (Gleevec, Novartis)	fibroma, non-small cell lung cancer, melanoma, prostate cancer	phase 2
imetelstat (Geron)	breast cancer, chronic lymphocytic leukemia, non-small cell lung cancer, multiple myeloma	phase 2
imexon (Amplimexon, AmpliMed)	non-Hodgkin's lymphoma	phase 2
IMO-2055 (Idera Pharmaceuticals)	head and neck cancers	phase 2
Imprime PGG (Biothera)	chronic lymphocytic leukemia, non-Hodgkin's lymphoma, non-small cell lung cancer/colorectal cancer	phase 2/phase 3
INCB24360 (Incyte)	melanoma	phase 2
indatuximab ravtansine (Biotest)	multiple myeloma	phase 2
indibulin (Ziopharm Oncology)	breast cancer	phase 2
ingenol mebutate (Picato, Leo Pharma)	basal cell carcinoma	phase 2
iniparib (Sanofi)	breast cancer, nonsquamous non-small cell lung cancer, ovarian cancer/squamous non-small cell lung cancer	phase 2/phase 3
INNO-206 (CytRx)	pancreatic ductal adenocarcinoma, soft tissue sarcoma	phase 2
inotuzumab ozogamicin (Pfizer)	acute lymphoblastic leukemia, non-Hodgkin's lymphoma	phase 3
interleukin-12 gene therapy (OncoSec Medical)	cutaneous T-cell lymphoma, melanoma	phase 2
intetumumab (Janssen Biotech)	melanoma, prostate cancer	phase 2
IPH-2101 (Innate Pharma)	multiple myeloma	phase 2
ipilimumab (Yervoy, Bristol-Myers Squibb)	non-small cell lung cancer, prostate cancer, skin cancers	phase 3
irinotecan drug-eluting beads (Biocompatibles International)	liver metastases from colorectal cancer	phase 2
IRX-2 (IRX Therapeutics)	head and neck cancers	phase 2
IRX4024 (Ico Therapeutics)	prostate cancer	phase 2
ISF35 (Memgen)	chronic lymphocytic leukemia, diffuse large cell lymphoma, follicular lymphoma, mantle cell lymphoma, small lymphocytic lymphoma	phase 2
ISIS-EIF4E (Isis)	non-small cell lung cancer, prostate cancer	phase 2
J 591 Lu-177 (BZL Biologics)	prostate cancer	phase 2
JNJ-26481585 (Janssen)	cutaneous T-cell lymphoma	phase 2
JNJ-40346527 (Janssen)	Hodgkin's lymphoma	phase 2
JX-594 (Jennerex Biotherapeutics)	colorectal cancer, liver cancer	phase 2
KD019 (Kadmon)	non-small cell lung cancer	phase 3
KD032 (Kadmon)	non-small cell lung cancer, pancreatic cancer	phase 2
KRN-330 (Kyowa Hakko Kirin Pharma)	colorectal cancer	phase 2
KW-2450 (Kyowa Hakko Kirin Pharma)	breast cancer	phase 2
KW-2478 (Kyowa Hakko Kirin Pharma)	multiple myeloma	phase 2
KX2-391 (Kinex Pharmaceuticals)	prostate cancer	phase 2
labetuzumab I-131 (Immunomedics)	colorectal cancer	phase 2
lansoprazole (Apricus Biosciences)	liver cancer	phase 2
lapatanib (Tykerb, GlaxoSmithKline)	colorectal cancer/breast cancer, gastric cancers, head and neck cancers	phase 2/phase 3

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LDE225 (Novartis)	basal cell carcinoma, pancreatic cancer	phase 2
LE-DT (Insys Therapeutics)	pancreatic cancer	phase 2
lenalidomide (Revlimid, Celgene)	chronic lymphocytic leukemia, diffuse large B-cell lymphoma, follicular lymphoma, myelodysplastic syndromes, myeloma	phase 3
lestaurtinib (Cephalon)	acute myelogenous leukemia	phase 2
letrozole (Femara, Novartis)	endometrial cancer	phase 2
leukemia DNA vaccine (Inovio Pharmaceuticals)	acute myelogenous leukemia, chronic myeloid leukemia	phase 2
leukocyte interleukin (Multikine, CEL-SCI)	head and neck cancers	phase 3
levonorgestrel-releasing intrauterine system (Mirena, Bayer HealthCare)	endometrial cancer	phase 2
Levulan PDT (DUSA Pharmaceuticals)	brain cancer	phase 2
linifanib (Abbott Laboratories)	breast cancer, colorectal cancer, non-small cell lung cancer, renal cancer/liver cancer	phase 2/phase 3
lintuzumab Ac-225 (Actimab-A, Actinium)	acute myelogenous leukemia	phase 2
lintuzumab Bi-213 (Bismab-A, Actinium)	acute myelogenous leukemia	phase 2
liposome encapsulated paclitaxel (Insys Therapeutics)	breast cancer	phase 2
lirilumab (Bristol-Myers Squibb)	acute myelogenous leukemia	phase 2
litronesib (Eli Lilly)	breast cancer, non-small cell lung cancer	phase 2
LOR-2040 (Lorus Therapeutics)	acute myelogenous leukemia, breast cancer, colorectal cancer, kidney cancer, prostate cancer	phase 2
lorvotuzumab mertansine (ImmunoGen)	small cell lung cancer	phase 2
lucatumumab (Novartis)	lymphoma	phase 2
LY2090314 (Eli Lilly)	acute myelogenous leukemia, acute promyelocytic leukemia	phase 2
LY2157299 (Eli Lilly)	brain cancer, liver cancer	phase 2
M-200 prophage cancer vaccine (Agenus)	melanoma	phase 3
M402 (Momenta Pharmaceuticals)	pancreatic cancer	phase 2
MAGE-A3 immunotherapeutic (GlaxoSmithKline)	bladder cancer / non-small cell lung cancer, melanoma	phase 2/phase 3
mapatumumab (GlaxoSmithKline)	liver cancer, non-small cell lung cancer, multiple myeloma	phase 2
masitinib (AB Science)	gastrointestinal stromal tumors, pancreatic cancer	phase 3
MB07133 (Ligand Pharmaceuticals)	liver cancer	phase 2
MEDI-551 (AstraZeneca/MedImmune)	hematologic malignancies	phase 2
MEDI-575 (AstraZeneca)	glioblastoma, non-small cell lung cancer	phase 2
melphalan drug delivery system (Delcath Systems)	liver cancer	phase 3
melphalan intravenous (Ligand/Spectrum)	myeloma	phase 2
MER-101 (Merrion Pharmaceuticals)	bone metastases	phase 2
MGCD265 (MethylGene)	non-small cell lung cancer	phase 2
mifamurtide (Junovan, Millennium Pharmaceuticals)	osteosarcoma	phase 3
milatuzumab (Immunomedics)	chronic lymphocytic leukemia, non-Hodgkin's lymphoma, multiple myeloma	phase 2
MK-1775 (Merck)	ovarian cancer	phase 2

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
MK-2206 (Merck)	neuroendocrine tumors	phase 2
MK-3475 (Merck)	melanoma	phase 2
MK-7956 (Merck)	chronic lymphocytic leukemia, mantle cell lymphoma	phase 2
MLN8237 (Millennium Pharmaceuticals)	peripheral T-cell lymphoma	phase 3
MLN9708 (Millennium Pharmaceuticals)	myeloma	phase 3
MM-111 (Merrimack Pharmaceuticals)	breast cancer	phase 2
MM-398 (Merrimack Pharmaceuticals)	pancreatic cancer	phase 2
motectinostat (MethylGene)	chronic lymphocytic leukemia, diffuse large B-cell lymphoma, follicular lymphoma	phase 2
mogamulizumab (Amgen)	T-cell leukemia/T-cell lymphoma	phase 2/phase 3
MORAb-003 (Eisai)	non-small cell lung cancer/ovarian cancer	phase 2/phase 3
MORAb-004 (Eisai)	melanoma	phase 2
MORAb-009 (Eisai)	mesothelioma	phase 2
motesanib (Amgen)	breast cancer/non-small cell lung cancer	phase 2/phase 3
motexafin gadolinium (PharmacyClics)	glioblastoma	phase 2
MSC1936369B (EMD Serono)	hematologic malignancies	phase 2
muparfostat (Progen Pharmaceuticals)	melanoma/liver cancer	phase 2/phase 3
MVA-BN PRO (BN ImmunoTherapeutics)	prostate cancer	phase 2
MVax melanoma vaccine (AVAX Technologies)	melanoma	phase 3
nanoparticle albumin-bound paclitaxel (Abraxane, Celgene)	melanoma	phase 3
navitoclax (AbbVie Laboratories)	chronic lymphocytic leukemia, lung cancer, lymphoma	phase 2
necitumumab (Bristol-Myers Squibb/Eli Lilly/ImClone)	non-small cell lung cancer	phase 3
nelarabine (Arranon, GlaxoSmithKline)	acute lymphoblastic leukemia, T-cell lymphoma	phase 3
NGR-hTNF (MolMed)	mesothelioma	phase 3
NiCord umbilical cord blood stem cell therapy (Gamida Cell)	hematologic malignancies	phase 2
nilotinib (Tasigna, Novartis)	acute lymphoblastic leukemia, chronic myeloid leukemia/gastrointestinal stromal tumors, melanoma	phase 2/phase 3
nimotuzumab (YM Biosciences)	brain cancer, pediatric glioma, prostate cancer	phase 2
nintedanib (Vargatef, Boehringer Ingelheim)	non-small cell lung cancer, ovarian cancer	phase 3
nivolumab (BMS-936558, Bristol-Myers Squibb)	lung cancer, melanoma, renal cell carcinoma	phase 3
NK-012 (Nippon Kayaku)	breast cancer, small cell lung cancer	phase 2
NLG-12036 (HyperAcute Melanoma, NewLink Genetics)	melanoma	phase 2
NTX-010 (Neotropix)	small cell lung cancer	phase 2
NV-1020 (Catherex)	liver cancer	phase 2
NX-101 (NexGenix)	dermal neurofibromatosis	phase 2
NX-1207 (Nymox Pharmaceutical)	prostate cancer	phase 2
obatoclax (Cephalon)	chronic lymphocytic leukemia, follicular lymphoma, mantle cell lymphoma, small cell lung cancer	phase 2

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
obinutuzumab (Biogen Idec/Genentech)	chronic lymphocytic leukemia, non-Hodgkin's lymphoma, B-cell lymphoma	phase 3
ocaratumab (Mentrik Biotech)	non-Hodgkin's lymphoma	phase 2
ODM-201 (Endo Pharmaceuticals)	prostate cancer	phase 2
ofatumumab (Arzerra, GlaxoSmithKline)	Waldenström's macroglobulinemia/chronic lymphocytic leukemia, diffuse large B-cell lymphoma, follicular lymphoma	phase 2/phase 3
olaratumab (Eli Lilly)	glioblastoma, ovarian cancer	phase 2
omacetaxine (Omapro, Cephalon)	acute myelogenous leukemia, myelodysplastic syndrome/chronic myeloid leukemia	phase 2/phase 3
ombrabulin (Sanofi)	non-small cell lung cancer, ovarian cancer/sarcoma	phase 2/phase 3
onartuzumab (Genentech)	breast cancer, colorectal cancer, glioblastoma/non-small cell lung cancer, gastric cancer	phase 2/phase 3
OncoVAX (Vaccinogen)	colorectal cancer	phase 2
Onyvax-105 anti-idiotypic cancer vaccine (VaxOnco)	prostate cancer	phase 2
Onyvax-P (VaxOnco)	prostate cancer	phase 2
OPT-822/OPT-821 (Optimer Biology)	breast cancer	phase 3
oral azacitidine (Celgene)	myelodysplastic syndrome	phase 2
oregovomab (Quest PharmaTech)	ovarian cancer	phase 2
OSI-027 (OSI Pharmaceuticals)	renal cancer	phase 2
OSI-906 (OSI Pharmaceuticals)	non-small cell lung cancer, ovarian cancer/adrenocortical carcinoma	phase 2/phase 3
Ovax autologous cell vaccine (AVAX Technologies)	ovarian cancer	phase 2
ozarelix (Spectrum Pharmaceuticals)	prostate cancer	phase 2
P27600 (Piramal Life Sciences)	mantle cell lymphoma	phase 2
paclitaxel poliglumex (Opaxio, Cell Therapeutics)	esophageal cancer, glioma, glioblastoma/fallopian tube cancer, non-small cell lung cancer, ovarian cancer, peritoneal cancer	phase 2/phase 3
paclitaxel polymeric micelle formulation (Samyang Biopharmaceuticals)	pancreatic cancer	phase 2
pacritinib (Cell Therapeutics)	relapsed lymphoma	phase 2
palbociclib (PD-0332991, Pfizer) <small>READ PERSPECTIVE on this drug from Douglas Yee, MD, on page 76.</small>	myeloma/breast cancer	phase 2/phase 3
palifosfamide (Ziopharm Oncology)	soft tissue sarcoma	phase 3
panitumumab (Vectibix, Amgen)	head and neck cancers/colorectal cancer	phase 2/phase 3
panobinostat (Novartis)	acute lymphoblastic leukemia, acute myelogenous leukemia, myelodysplastic syndrome, prostate cancer, renal cancer/multiple myeloma	phase 2/phase 3
pazopanib (Votrient, GlaxoSmithKline)	fallopian tube cancer, kidney cancer, ovarian cancer, peritoneal cancer	phase 3
PB-272 (Puma Biotechnology)	breast cancer	phase 2
PCI-27483 (Pharmacyclics)	pancreatic cancer	phase 2
PEG arginine deiminase (Polaris Pharmaceuticals)	melanoma/hepatocellular carcinoma	phase 2/phase 3
pegdinetanib (Bristol-Myers Squibb)	non-small cell lung cancer	phase 2
PEGPH20 (Halozyme Therapeutics)	pancreatic cancer	phase 2
pemetrexed (Alimta, Eli Lilly)	non-small cell lung cancer	phase 3
perifosine (Aeterna Zentaris)	chronic lymphocytic leukemia, gastrointestinal stromal tumors, glioma, lymphoma, non-small cell lung cancer, renal cancer, sarcoma, Waldenström's macroglobulinemia/colorectal cancer, multiple myeloma	phase 2/phase 3

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
pertuzumab (Perjeta, Genentech)	gastric cancer/breast cancer	phase 2/phase 3
pertuzumab companion diagnostic (HER-2 FISH pharmDx; Dako, Genentech)	breast cancer diagnosis	phase 3
pertuzumab companion diagnostic (HercepTest; Dako, Genentech)	breast cancer diagnosis	phase 3
PF-04691502 (Pfizer)	endometrial cancer	phase 2
PF-05212384 (Pfizer)	endometrial cancer	phase 2
PHA848125 (Nerviano Medical Services)	thymoma	phase 2
phenoxodiol (Marshall Edwards)	fallopian tube cancer, prostate cancer/ovarian cancer	phase 2/phase 3
PHY906 (PhytoCeutica)	colorectal cancer, liver cancer, pancreatic cancer	phase 2
picoplatin (Poniard Pharmaceuticals)	colorectal cancer, ovarian cancer, prostate cancer, small cell lung cancer	phase 2
pidilizumab (CureTech)	diffuse large B-cell lymphoma	phase 2
pixantrone (Cell Therapeutics)	breast cancer/diffuse large B-cell lymphoma	phase 2/phase 3
PKC412 (Novartis Pharmaceuticals)	acute myelogenous leukemia	phase 3
plinabulin (Nereus Pharmaceuticals)	non-small cell lung cancer	phase 2
plitidepsin (Aplidin, PharmaMar)	myeloma	phase 3
PLX3397 (Plexxikon)	acute myelogenous leukemia, glioblastoma, Hodgkin's lymphoma	phase 2
PM-00104 (PharmaMar)	cervical cancer, endometrial cancer, Ewing's sarcoma	phase 2
PNT2258 (ProNAi Therapeutics)	B-cell lymphoma	phase 2
POL-103A melanoma vaccine (Polynoma)	melanoma	phase 3
polyclonal antibody stimulator (Cancer Advances)	colorectal cancer/gastric cancer, pancreatic cancer	phase 2/phase 3
poly-ICLC (Oncovir)	anaplastic astrocytoma (adolescents and children), glioblastoma (adolescents and children)	phase 2
pomalidomide (Actimid, Celgene)	small cell lung cancer, pancreatic cancer	phase 2
ponatinib (Iclusig, Ariad Pharmaceuticals)	acute myelogenous leukemia/chronic myeloid leukemia	phase 2/phase 3
PR104 (Proacta)	acute myelogenous leukemia	phase 2
pralatrexate (Folotyn, Allos Therapeutics)	bladder cancer, breast cancer, lung cancer, B-cell non-Hodgkin's lymphoma/peripheral T-cell lymphoma	phase 2/phase 3
ProstAtak gene therapy (Advantagene)	prostate cancer	phase 3
prostate cancer vaccine (Novartis/Pepscan)	prostate cancer	phase 2
PRX-302 (Sophiris Bio)	prostate cancer	phase 2
PT107 (Pique Therapeutics)	non-small cell lung cancer	phase 2
PTC299 (PTC Therapeutics)	breast cancer, central nervous system cancer	phase 2
PV-10 (Provectus Pharmaceuticals)	melanoma	phase 2
PV701 (Wellstat Biologics)	cervical cancer, colorectal cancer	phase 2
PX-866 (Oncothyreon)	glioblastoma, head and neck cancers, non-small cell lung cancer, prostate cancer	phase 2
quizartinib (AC220, Ambit Biosciences)	acute myelogenous leukemia	phase 2
radium-223 chloride (Alpharadin; Algeta, Bayer)	bone metastases	phase 3
ramucirumab (IMC-1121B, Eli Lilly) READ PERSPECTIVE on this drug from Tanios Bekaii-Saab, MD, on page 75.	breast cancer, colorectal cancer, gastric cancer, hepatocellular carcinoma, lung cancer	phase 3

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
ranpirnase (Tamir Biotechnology)	non-small cell lung cancer	phase 2
regorafenib (Stivarga, Bayer HealthCare)	renal cancer/colorectal cancer	phase 2/phase 3
reovirus (Reolysin, Oncolytics Biotech)	glioma, melanoma, non-small cell lung cancer, ovarian cancer, pancreatic cancer, sarcoma/head and neck cancers	phase 2/phase 3
retaspimycin (Infinity Pharmaceuticals)	non-small cell lung cancer	phase 2
Reximmune-C (Epeius Biotechnologies)	breast cancer	phase 2
Rexin-G (Epeius Biotechnologies)	breast cancer, osteosarcoma, pancreatic cancer, soft tissue sarcoma	phase 2
RG7160 (Roche)	colorectal cancer	phase 2
RG7414 (Genentech)	colorectal cancer, non-small cell lung cancer	phase 2
RG7597 (Genentech)	head and neck cancers	phase 2
RG7686 (Roche)	liver cancer	phase 2
ridaforolimus (MK-8669, Ariad Pharmaceuticals/Merck)	breast cancer, endometrial cancer, non-small cell lung cancer, prostate cancer, sarcoma	phase 2
rigosertib (Onconova Therapeutics)	acute myelogenous leukemia, chronic lymphocytic leukemia, lymphoma, ovarian cancer/myelodysplastic syndrome, pancreatic cancer	phase 2/phase 3
rilmogene galvacirepvec (BM ImmunoTherapeutics)	prostate cancer	phase 3
rindopepimut (CellDex Therapeutics)	glioblastoma	phase 3
rintatolimod (Hemispherx Biopharma)	cancer vaccine adjuvant	phase 2
robatumumab (Merck)	colorectal cancer, osteosarcoma, sarcoma	phase 2
romidepsin (Istodax, Celgene)	pancreatic cancer, prostate cancer, renal cancer/peripheral T-cell lymphoma	phase 2/phase 3
RP101 (RESprotect)	pancreatic cancer	phase 3
rucaparib (Clovis Oncology)	breast cancer, ovarian cancer	phase 2
ruxolitinib (Jakafi, Incyte)	hematologic malignancies, pancreatic cancer	phase 2
RX-0201 (Archexin, Rexahn Pharmaceuticals)	pancreatic cancer	phase 2
S-1 (Taiho Pharma)	gastric cancer	phase 3
sagopilone (Bayer HealthCare)	breast cancer, ovarian cancer, prostate cancer	phase 2
samalizumab (ALXN600, Alexion Pharmaceuticals)	chronic lymphocytic leukemia, multiple myeloma	phase 2
samarium SM-153 lexidronam injection (EUSA Pharma)	breast cancer, multiple myeloma, osteosarcoma, prostate cancer/bone metastases	phase 2/phase 3
sapacitabine (Cyclacel Pharmaceuticals)	chronic lymphocytic leukemia, myelodysplastic syndrome, non-small cell lung cancer/acute myelogenous leukemia	phase 2/phase 3
SAR245408 (Sanofi/Exelixis)	breast cancer, endometrial cancer	phase 2
SAR245409 (Exelixis/Sanofi)	non-Hodgkin's lymphoma	phase 2
SAR24509 (Sanofi/Exelixis)	breast cancer, non-Hodgkin's lymphoma	phase 2
SAR256212 (Merrimack Pharmaceuticals/Sanofi)	breast cancer, non-small cell lung cancer	phase 2
SAR3419 (Sanofi)	non-Hodgkin's lymphoma	phase 2
saridegib (Infinity Pharmaceuticals)	chondrosarcoma	phase 2
SB1518 (S*Bio)	myelodysplastic syndrome, myeloid leukemia	phase 2
SBG (Biotec Pharmacon)	pediatric neuroblastoma	phase 2
seliciclib (Cyclacel Pharmaceuticals)	head and neck cancers	phase 2

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
sepantronium bromide (Astellas)	non-Hodgkin's lymphoma	phase 2
SF1 (SonneMed)	breast cancer	phase 2
SGI1110 (Astex Pharmaceuticals)	acute myelogenous leukemia, myelodysplastic syndrome	phase 2
SG2000 (Spirogen)	ovarian cancer	phase 2
siltuximab (Janssen Biotech)	giant lymph node hyperplasia, multiple myeloma	phase 2
sipuleucel-T (Provenge, Dendreon)	prostate cancer	phase 2/phase 3
SL-401 (Stemline Therapeutics)	acute myelogenous leukemia, myelodysplastic syndrome	phase 2
SL-701 (Stemline Therapeutics)	glioma	phase 2
SNS01-T (Senesco Technologies)	multiple myeloma	phase 2
SOM230 (Novartis)	meningioma, neuroendocrine tumors/carcinoid tumors	phase 2/phase 3
sorafenib (Nexavar, Bayer HealthCare)	acute myelogenous leukemia, colorectal cancer, head and neck cancers, multiple myeloma, myelodysplastic syndrome, ovarian cancer/breast cancer, hepatocellular carcinoma, kidney cancer, non-small cell lung cancer, thyroid cancer	phase 2/phase 3
sotatercept (Celgene)	cancer metastases	phase 2
squalamine (OHR Pharmaceutical)	ovarian cancer	phase 2
SR 16234 (SRI International)	breast cancer	phase 2
sunitinib (Sutent, Pfizer)	renal cell carcinoma	phase 3
Sym004 (Symphogen)	colorectal cancer	phase 2
tabalumab (Eli Lilly)	myeloma	phase 2
TAK-700 (Millennium Pharmaceuticals)	prostate cancer	phase 3
talactoferrin alfa (Agennix)	non-small cell lung cancer	phase 3
talapofin (Aptocine, Light Sciences Oncology)	colorectal cancer	phase 3
talimogene laherparepvec (Amgen) <small>READ PERSPECTIVE on this drug from Robert H.I. Andtbacka, MD, CM, FACS, FRCSC, on page 76.</small>	melanoma	phase 3
tamibarotene (CytRx)	acute promyelocytic leukemia, non-small cell lung cancer	phase 2
TAS-106 (Taiho Pharma)	head and neck cancers	phase 2
tasquinimod (Active Biotech)	prostate cancer	phase 3
Tc-99m ethylenedicycysteine glucosamine (Cell Point)	diagnosis of non-small cell lung cancer	phase 3
Tc-99m tilmanocept (Lymphoseek, Navidea Pharmaceuticals)	diagnosis of head and neck cancers	phase 3
telapristone (Repros Therapeutics)	uterine leiomyoma	phase 2
telatinib (ACT Biotech)	gastric cancer	phase 2
temozolomide (Temodar, Merck)	acute myelogenous leukemia, small cell lung cancer	phase 2
temsirolimus (Torisel, Pfizer)	renal cell carcinoma	phase 3
terameprocol (Erimos Pharmaceuticals)	cervical cancer, glioma	phase 2
tergenpumatumucel-L (HyperAcute Lung, NewLink Genetics)	non-small cell lung cancer	phase 2
tesetaxel (Genta)	bladder cancer, breast cancer, gastric cancer, prostate cancer, melanoma	phase 2
TH-302 (EMD Serono, Threshold Pharmaceuticals)	astrocytoma, leukemia, multiple myeloma, pancreatic cancer/soft tissue sarcoma	phase 2/phase 3

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
thiarabine (Access Pharmaceuticals)	leukemia, lymphoma	phase 2
thymalfasin alfa 1 (Zadaxin, SciClone Pharmaceuticals)	liver cancer/skin cancer	phase 2/phase 3
tigapotide (Kotinos Pharmaceuticals)	prostate cancer	phase 2
tigatuzumab (Daiichi Sankyo)	breast cancer, liver cancer, ovarian cancer, pancreatic cancer	phase 2
tivantinib (ArQule)	colorectal cancer, germ cell and embryonal neoplasms, kidney cancer, liver cancer, soft tissue sarcoma/non-small cell lung cancer	phase 2/phase 3
tivozanib (Astellas/Aveo)	breast cancer, colorectal cancer/renal cancer	phase 2/phase 3
TL-32711 (TetraLogic)	acute myelogenous leukemia	phase 2
Toca 511/Toca FC (Tocagen)	glioblastoma	phase 2
topotecan (Hycamtin, GlaxoSmithKline)	brain cancer	phase 3
tosedostat (Chroma Therapeutics)	acute myelogenous leukemia	phase 2
tositumomab and iodine I-131 tositumomab (Bexxar, GlaxoSmithKline)	mantle cell lymphoma	phase 2
trabectedin (Johnson & Johnson)	prostate cancer, soft tissue sarcoma (adolescents and children)/breast cancer, ovarian cancer, soft tissue sarcoma (adults)	phase 2/phase 3
trametinib (GlaxoSmithKline)	colorectal cancer, non-small cell lung cancer, lymphoma, multiple myeloma, pancreatic cancer/leukemia, melanoma	phase 2/phase 3
trans-sodium crocetinate (Diffusion Pharmaceuticals)	glioblastoma	phase 2
trastuzumab-DM1 companion diagnostic (HercepTest; Dako, Genentech)	breast cancer diagnosis	phase 3
trastuzumab-DM1 companion diagnostic (HER2 FISH pharmDx; Dako, Genentech)	breast cancer diagnosis	phase 3
TRC 105 (Tracon Pharmaceuticals)	breast cancer, fallopian tube cancer, ovarian cancer, peritoneal cancer, prostate cancer	phase 2
trebananib (Amgen)	breast cancer, colorectal cancer, esophageal cancer, fallopian tube cancer, gastric cancer, liver cancer, peritoneal cancer, renal cancer/ovarian cancer	phase 2/phase 3
treosulfan (Medac)	acute lymphoblastic leukemia, acute myelogenous leukemia, myelodysplastic syndrome	phase 2
TRU-016 (Emergent BioSolutions)	chronic lymphocytic leukemia, non-Hodgkin's lymphoma	phase 2
tumor-associated antigen vaccine (TroVax, Oxford)	prostate cancer	phase 2
TVI-Brain-1 (TVAX Biomedical)	glioma	phase 2
TVI-Kidney-1 (TVAX Biomedical)	renal cell carcinoma	phase 2
ulipristal (Watson Pharmaceuticals)	uterine leiomyoma	phase 3
upamostat (Wilex)	breast cancer	phase 2
uridine triacetate (Wellstat Therapeutics)	gastric cancer/pancreatic cancer	phase 2/phase 3
V503 (Merck)	cervical cancer prevention, vulvovaginal cancer prevention	phase 3
V505 (Merck)	cervical cancer prevention	phase 2
VAL-083 (Del Mar Pharmaceuticals)	glioma	phase 2
varlitinib (Aslan Pharmaceuticals)	breast cancer	phase 2
VB-111 (VBL Therapeutics)	glioblastoma, thyroid cancer	phase 2
VB4-845 (Viventia Biotechnologies)	bladder cancer, head and neck cancers	phase 2
velimogene aliplasmid (Allovectin, Vical)	melanoma	phase 3
veltuzumab (Immunomedics)	chronic lymphocytic leukemia, non-Hodgkin's lymphoma	phase 2

Oncology Drugs in the Pipeline

Generic name (Brand name, Manufacturer)	Indication(s)	Development status
vemurafenib (Zelboraf, Genentech)	brain metastases, myeloma, thyroid cancer/adjuvant metastatic melanoma	phase 2/phase 3
VeriStrat companion diagnostic test (Biodesix)	breast cancer	phase 3
VGX-3100 (Inovio Pharmaceuticals)	cervical intraepithelial neoplasia	phase 2
vincristine sulfate liposome injection (Marqibo, Talon Therapeutics)	non-Hodgkin's lymphoma, melanoma, pediatric cancers/acute lymphoblastic leukemia	phase 2/phase 3
Virulizin (Lorus Therapeutics)	pancreatic cancer	phase 3
vismodegib (Erivedge, Genentech)	colorectal cancer, basal cell carcinoma	phase 2
vitespen (Oncophage, Agenus)	renal cell carcinoma	phase 2
volasertib (Boehringer Ingelheim)	urogenital cancer/acute myelogenous leukemia	phase 2/phase 3
volociximab (Abbott Laboratories/Biogen Idec)	non-small cell lung cancer	phase 2
vorinostat (Zolinza, Merck)	acute myelogenous leukemia, B-cell lymphoma, breast cancer, gynecologic cancer, myelodysplastic syndrome, peritoneal cancer/mesothelioma, myeloma	phase 2/phase 3
vosaroxin (Sunesis Pharmaceuticals)	ovarian cancer/acute myelogenous leukemia	phase 2/phase 3
VT-464 (Viamet Pharmaceuticals)	prostate cancer	phase 2
VTX-2337 (VentiRx Pharmaceuticals)	B-cell lymphoma	phase 2
WT1 immunotherapeutic (GlaxoSmithKline)	acute myelogenous leukemia	phase 2
Y-90 clivatuzumab (Immunomedics)	pancreatic cancer	phase 2
YM155 (Astellas)	breast cancer, non-Hodgkin's lymphoma	phase 2
zanolimumab (Emergent BioSolutions)	peripheral T-cell lymphoma	phase 2

Information in this chart was compiled from the Pharmaceutical Research and Manufacturers of America, NIH (www.clinicaltrials.gov), corporate websites and the databases of HEMONC TODAY. The publisher or editors do not assume responsibility for any errors or omissions.

HEMONC TODAY asked key opinion leaders to offer perspective about oncology drugs in the pipeline they believe have the potential to change practice.

PERSPECTIVE: RAMUCIRUMAB



Tanios Bekaii-Saab

Ramucirumab (IMC-1121B, Eli Lilly) is a fully human monoclonal antibody (IgG1) directed against the vascular endothelial growth factor receptor 2 (VEGFR2), a receptor that is responsible for the majority of VEGF-mediated effects in angiogenesis. There is currently no standard second-line therapy for advanced cancers of the esophagus and stomach and, following initial disappointment with agents targeting VEGF, ramucirumab will have the potential to fill this treatment gap. Findings from the international REGARD trial — a phase 3 trial of second-line therapy for advanced gastric or gastroesophageal junction (GEJ) adenocarcinoma — demonstrate that ramucirumab is tolerable and significantly improves median OS and PFS following progression on first-line chemotherapy (Fuchs C. Abstract #LBA5. Presented at: Gastrointestinal Cancers Symposium; Jan. 14-16, 2013; San Francisco). The magnitude of this improvement is similar to those observed with cytotoxic agents such as paclitaxel in this setting. An ongoing randomized clinical trial (RAINBOW) is further assessing the role of ramucirumab in combination with paclitaxel in second-line treatment compared with paclitaxel alone in patients with advanced GEJ adenocarcinoma. Given the initial enthusiasm with ramucirumab, including its likelihood to be approved for the treatment of refractory GEJ cancer, this study may well push the survival benefit even further in this desperate disease.

— Tanios Bekaii-Saab, MD

HEMONC TODAY Editorial Board member

Disclosure: Bekaii-Saab reports no relevant financial disclosures.

PERSPECTIVE: BEVACIZUMAB



Maurie Markman

Although not yet approved by the FDA for routine use in the gynecologic malignancies, the administration of bevacizumab (Avastin, Genentech) in combination with cytotoxic chemotherapy has been shown to improve survival outcomes in cancers of the ovary and cervix. In ovarian cancer, phase 3 randomized trials have revealed a statistically significant favorable impact on PFS when the anti-angiogenic agent is added to carboplatin/paclitaxel in the primary setting (Burger RA. *N Engl J Med.* 2011;365:2473-2483. Perren TJ. *N Engl J Med.* 2011;365:2484-2496); with carboplatin/gemcitabine in potentially platinum-sensitive recurrent disease (Aghajanian C. *J Clin Oncol.* 2012;30:2039-2045); and with either weekly paclitaxel, topotecan or pegylated liposomal doxorubicin in platinum-resistant tumors (Pujade-Lauraine E. *J Clin Oncol.* 2012;30:327s). In one of the two reported phase 3 primary chemotherapy trials, data suggest that patients with the most advanced disease may experience an OS benefit when bevacizumab is added to the carboplatin/paclitaxel program. In cervix cancer, a recently reported phase 3 trial by Tewari and colleagues — results of which are scheduled to be presented at the 2013 ASCO Annual Meeting — has revealed that adding the anti-angiogenic drug to cisplatin/paclitaxel or topotecan/paclitaxel improves both PFS and OS in the setting of metastatic, persistent or recurrent disease.

— Maurie Markman, MD

HEMONC TODAY Editorial Board member

Disclosure: Markman reports no relevant financial disclosures.

Oncology Drugs in the Pipeline

PERSPECTIVE: PALBOCICLIB



Douglas Yee

A decline in Ki67 in response to an endocrine therapy has served as a predictive biomarker for clinical benefit. As a surrogate marker for proliferation, tumors with high Ki67 have proliferative rates that do not appear to be affected by estrogen receptor (ER) alpha-targeted therapies alone. It has long been known that control of the progression through the cell cycle is mediated by the cyclin proteins and their interactions with the cyclin dependent kinases (CDK). The serine-threonine kinases CDK 4 and 6 interact with cyclin D1 to hyperphosphorylate the retinoblastoma protein and allow cell cycle progression into S-phase. Thus, inhibition of cell proliferation through disruption of CDK4/6 function could be useful in highly proliferative tumors. Palbociclib (PD-0332991, Pfizer) is an oral CDK4/6 inhibitor and was tested in ER-positive, HER-2-negative metastatic breast cancer in the TRIO-18 trial. This randomized phase 2 study demonstrated that the addition of palbociclib to letrozole enhanced objective response, clinical benefit rate and PFS (Finn RS. Abstract #S1-6. Presented at: San Antonio Breast Cancer Symposium; Dec. 4-8, 2012; San Antonio). Based on these data, palbociclib received designation as a "breakthrough therapy" by the FDA. The designation is intended to speed up the review and development of this drug. A randomized phase 3 study of letrozole with or without palbociclib (NCT01740427) in first-line treatment of advanced breast cancer is currently open to accrual. Palbociclib is also undergoing testing in other cancer cell types, including sarcoma, ovarian cancer, myeloma and glioblastoma).

— Douglas Yee, MD

HEM Onc TODAY Editorial Board member

Disclosure: Yee reports no relevant financial disclosures.

PERSPECTIVE: TALIMOGENE LAHERPAREPVEC



Robert H.I. Andtbacka

Talimogene laherparepvec (Amgen) is a herpes simplex virus type-1-derived oncolytic immunotherapy virus. T-VEC is administered by direct injection into tumors, where it selectively infects and replicates in tumor cells. Virus replication leads to tumor cell lysis and exposure of tumor-specific antigens to the patient's immune system, resulting in a local and systemic immune activation and an immune-mediated destruction of tumor cells throughout the body. To enhance the local and systemic antitumor immune response, T-VEC is engineered to express granulocyte macrophage colony-stimulating factor (GM-CSF).

A Phase 2 study evaluated the safety and effect of T-VEC in 50 patients with stage IIIC or IV melanoma. T-VEC was well tolerated, with adverse effects limited primarily to grade 1 or 2. The most common adverse effects observed were transient flulike symptoms. The overall response rate to T-VEC was 26%. Responses were seen in injected and noninjected lesions. Similar to other immunotherapies, it may take several months for patients to respond to T-VEC, and it is not uncommon for new metastatic lesions to develop before a response is seen. The results of phase 2 study led to the OPTIM phase 3 randomized trial in which 436 patients with unresected stage IIIB, IIIC or IV melanoma were randomly assigned 2:1 to receive T-VEC injected intralesionally or GM-CSF subcutaneously. The treatment could last for up to 18 months, and patients with stable or responding disease could get additional treatment on an extension protocol. The primary endpoint was durable response rate (DRR), defined as a partial or complete response lasting continuously for at least 6 months.

T-VEC had a statistically significant greater DRR compared with GM-CSF (16% vs. 2%). A pre-planned interim analysis indicated a trend toward improved OS in patients treated with T-VEC. Since OS is an event-driven endpoint, a final analysis will be conducted when sufficient events have occurred. This is anticipated late this year.

One advantage of T-VEC compared with many other immune- and chemotherapies is the low adverse effect profile. This may render T-VEC especially useful in patients with a poorer performance status. One disadvantage of T-VEC compared with systemic agents is the need to directly inject T-VEC into palpable skin/subcutaneous tumors or palpable lymph nodes. Patients with tumor metastases available for direct injection represent a relatively small portion of all patients with metastatic melanoma.

The role of T-VEC as a single agent or in combination with other agents also needs to be established. A current study is evaluating T-VEC in combination with ipilimumab (Yervoy, Bristol-Myers Squibb) and will provide valuable insight into the combined use of two different immunomodulating agents in patients with metastatic melanoma.

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PERSPECTIVE: AFATINIB



Tobenna Nwizu

The epidermal growth factor receptor (EGFR) is upregulated in more than 90% of patients with head and neck squamous cell carcinoma (HNSCC), making EGFR an attractive therapeutic target.

Afatinib (Boehringer Ingelheim) is a next-generation, oral, irreversible EGFR tyrosine kinase inhibitor that has been shown to have activity in a wide variety of malignancies. It works by covalently binding and irreversibly inhibiting all kinase-competent ErbB family members, including human epidermal growth factor receptor 2 (HER-2) and EGFR. Resistance to first-generation TKIs like erlotinib (Tarceva, Genentech), gefitinib (Iressa, AstraZeneca) and lapatinib (Tykerb, GlaxoSmithKline) typically occurs through molecular plasticity of the ErbB pathway axis, leading to increased expression of other ErbB family members and cognate ligands. Afatinib overcomes this resistance by inhibiting multiple members of the ErbB family, thereby improving efficacy. The most common side effects are diarrhea and skin rash.

A recent phase 2 trial by Seiwert and colleagues compared afatinib to cetuximab (Seiwert TY. 2012. *Ann Oncol.* 23[suppl 11]:xi35-xi36). The analysis included 124 patients with recurrent or metastatic HNSCC who had failed platinum-based therapy. They were randomly assigned to receive afatinib 50 mg/day or cetuximab weekly until disease progression. Crossover was allowed. The results were equivalent, with a PFS of 15.9 weeks for the afatinib-treated patients and 15.1 weeks for the cetuximab group ($P=.78$).

An improved overall response rate was seen in the afatinib arm (16.1% vs. 6.5%), although this did not prove statistically significant. Patients who progressed on cetuximab and then crossed over to afatinib had a disease control rate of 38.9%, for a median 20.2 weeks. The results of this trial have generated considerable interest. Afatinib is the first EGFR TKI to show activity in HNSCC that is comparable to cetuximab in platinum-refractory patients. Afatinib also appears to be effective in patients who have failed cetuximab. Larger phase 3 trials are needed to confirm these findings and are currently under way.

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PERSPECTIVE: DASATINIB



Manmeet Ahluwalia

Dasatinib (Sprycel, Bristol-Myers Squibb) is an inhibitor of c-SRC and other Src family kinases (SFK), such as LYN and FYN, and also has activity against BCR-ABL, KIT, PDGFR α/β and EPHA2. It is FDA approved for patients with Philadelphia chromosome-positive chronic myeloid leukemia and is undergoing evaluation in patients with glioblastoma (GBM). Bevacizumab (Avastin, Genentech), a monoclonal antibody that targets the vascular endothelial growth factor, was approved by the FDA in May 2009 for patients with recurrent GBM. Although bevacizumab can result in significant initial clinical benefit in most patients, tumor recurrence develops and often is associated with increased tumor invasiveness. Hence there is an urgent need to develop approaches that can prevent invasion in recurrent GBM treated with bevacizumab. Using an orthotopic xenograft model, Anastasiadis and colleagues recently demonstrated that SFK signaling is markedly elevated at the invasive tumor front when treated with bevacizumab. They also showed that dasatinib effectively blocked the increased invasion seen with bevacizumab. This has led to a randomized clinical trial evaluating the efficacy of dasatinib with bevacizumab vs. bevacizumab alone in recurrent GBM. This trial will help answer the question whether a strategy to prevent cell migration and invasion is successful in improving the efficacy and outcomes of patients with recurrent GBM treated with bevacizumab.

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Huvelde D. *PLoS One.* 2013;8:e56505.

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