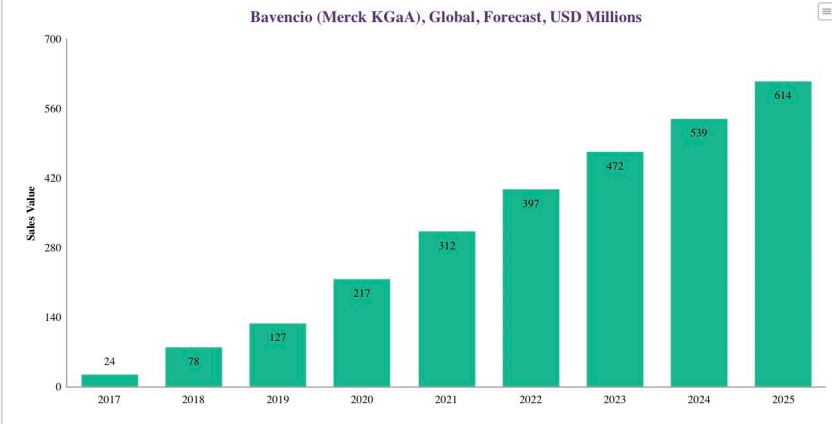
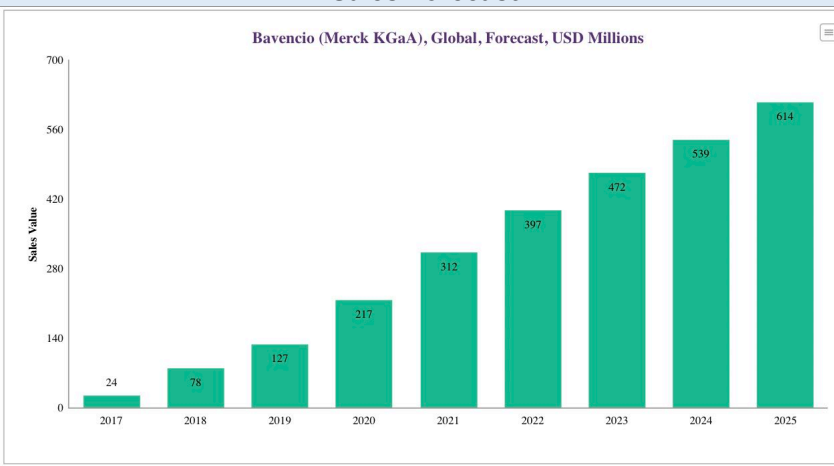


PIPELINE REVIEW

Bavencio® (avelumab)

Page	Indication	Date Approved	Date Updated
2	Adenocarcinoma of the Gastroesophageal Junction	N/A	May 30, 2019
3	Metastatic Renal Cell Carcinoma	May 14, 2019	May 30, 2019
4	Metastatic Transitional (Urothelial) Tract Cancer	May 9, 2017	May 30, 2019
5	Merkel Cell Carcinoma	March 23, 2017	May 30, 2019

Drug Information			Regulatory Information																					
Manufacturer:	Merck		Application Type:	N/A																				
Drug Brand Name:	Bavencio®		Original Anticipated Approval (PDUFA):	N/A																				
			Regulatory Status:	Phase III																				
Drug Generic Name:	avelumab		Regulatory Status Date:	12/9/2015																				
			Regulatory Status Reason:	N/A																				
Drug Type:	Monoclonal Antibody		Orphan Drug Designation:	10/11/2017																				
			FDA Fast Track Designation:	N/A																				
Route of Administration:	Intravenous		Breakthrough Therapy Designation	N/A																				
			Priority Review Designation:	N/A																				
Indication Details			Sales Forecast																					
Indication	Prevalence Type	Prevalence	<div><div>Bavencio (Merck KGaA), Global, Forecast, USD Millions</div><table><thead><tr><th>Year</th><th>Sales Value (USD Millions)</th></tr></thead><tbody><tr><td>2017</td><td>24</td></tr><tr><td>2018</td><td>78</td></tr><tr><td>2019</td><td>127</td></tr><tr><td>2020</td><td>217</td></tr><tr><td>2021</td><td>312</td></tr><tr><td>2022</td><td>397</td></tr><tr><td>2023</td><td>472</td></tr><tr><td>2024</td><td>539</td></tr><tr><td>2025</td><td>614</td></tr></tbody></table></div>		Year	Sales Value (USD Millions)	2017	24	2018	78	2019	127	2020	217	2021	312	2022	397	2023	472	2024	539	2025	614
Year	Sales Value (USD Millions)																							
2017	24																							
2018	78																							
2019	127																							
2020	217																							
2021	312																							
2022	397																							
2023	472																							
2024	539																							
2025	614																							
Gastric Cancer / Adenocarcinoma of the Gastroesophageal Junction	U.S.	45,147																						
	Global	1,040,557																						
			Source: GlobalData, Pharma Intelligence Center. https://pharma.globaldata.com , Accessed: May 28, 2019.																					
Comments Section																								
<p>Bavencio® (avelumab) is currently undergoing a Phase III trial (JAVELIN Gastric 100), evaluating the drug as first-line maintenance therapy following induction chemotherapy in unresectable, locally-advanced, or metastatic gastric or GEJ cancer.</p> <p>NOTE: Phase III, likelihood of approval: 63%</p> <p>Sources: GlobalData, Pharma Intelligence Center. https://pharma.globaldata.com, Accessed: May 30, 2019. “Merck KGaA, Darmstadt, Germany, and Pfizer Initiate Two Phase III Studies of Investigational Immunotherapy Avelumab in Advanced Gastric and Gastro-Esophageal Junction Cancers.” <i>Pfizer</i>, 9 Dec. 2015, www.pfizer.com/news/press-release/press-release-detail/merck-kgaa-darmstadt-germany-and-pfizer-initiate-two-phase-iii-studies-of-investigational-immunotherapy-avelumab-in-advanced-gastric-and-gastro-esophageal-junction-cancers. “Merck KGaA, Darmstadt, Germany, and Pfizer Provide Update on Phase III JAVELIN Gastric 300 Study in Patients with Pre-Treated Advanced Gastric Cancer.” <i>Pfizer</i>, 28 Nov. 2017, www.pfizer.com/news/press-release/press-release-detail/merck-kgaa-darmstadt-germany-and-pfizer-provide-update-on-phase-iii-javelin-gastric-300-study-in-patients-with-pre-treated-advanced-gastric-cancer.</p>																								

Drug Information			Regulatory Information																					
Manufacturer:	Merck		Application Type:	Supplemental BLA																				
Drug Brand Name:	Bavencio®		Original Anticipated Approval (PDUFA):	6/28/2019																				
			Regulatory Status:	Approved																				
Drug Generic Name:	avelumab		Regulatory Status Date:	5/14/2019																				
			Regulatory Status Reason:	N/A																				
Drug Type:	Monoclonal Antibody		Orphan Drug Designation:	N/A																				
			FDA Fast Track Designation:	N/A																				
Route of Administration:	Intravenous		Breakthrough Therapy Designation	12/21/2017																				
			Priority Review Designation:	2/11/2019																				
Indication Details			Sales Forecast																					
Indication	Incidence Type	Incidence	 <p>Bavencio (Merck KGaA), Global, Forecast, USD Millions</p> <table><thead><tr><th>Year</th><th>Sales Value (USD Millions)</th></tr></thead><tbody><tr><td>2017</td><td>24</td></tr><tr><td>2018</td><td>78</td></tr><tr><td>2019</td><td>127</td></tr><tr><td>2020</td><td>217</td></tr><tr><td>2021</td><td>312</td></tr><tr><td>2022</td><td>397</td></tr><tr><td>2023</td><td>472</td></tr><tr><td>2024</td><td>539</td></tr><tr><td>2025</td><td>614</td></tr></tbody></table> <p>Source: GlobalData, Pharma Intelligence Center. https://pharma.globaldata.com, Accessed: May 28, 2019.</p>		Year	Sales Value (USD Millions)	2017	24	2018	78	2019	127	2020	217	2021	312	2022	397	2023	472	2024	539	2025	614
Year	Sales Value (USD Millions)																							
2017	24																							
2018	78																							
2019	127																							
2020	217																							
2021	312																							
2022	397																							
2023	472																							
2024	539																							
2025	614																							
Metastatic Renal Cell Carcinoma	U.S.	10.9 / 100,000*																						
	Global	> 400,000*																						

Comments Section

On May 14, 2019, FDA approved Bavencio® (avelumab) in combination with Inlyta® (axitinib) for first-line treatment of patients with advanced renal cell carcinoma (RCC).

Renal Cell Carcinoma Prevalence (U.S., 2019): 248,722
Renal Cell Carcinoma Prevalence (Global, 2019): 997,049
It is estimated that there will be 73,820 new cases of kidney and renal pelvis cancers diagnosed in 2019.**
It is estimated that up to 30% of patients with renal cell carcinoma have metastatic disease at the time of diagnosis.***

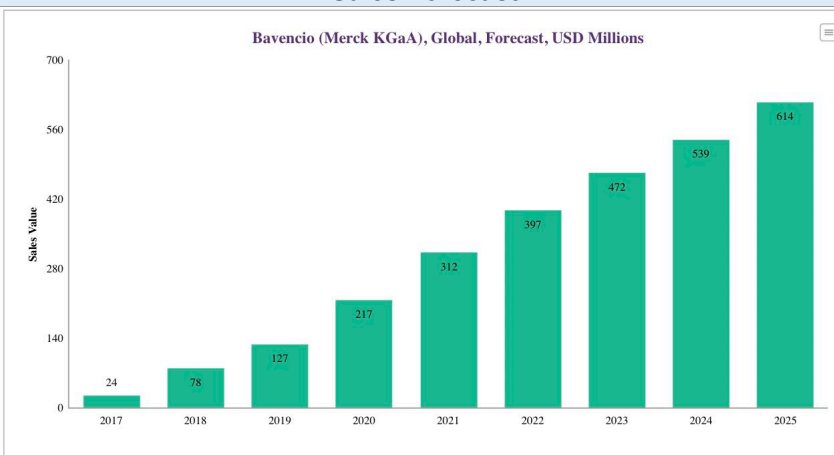
Sources:
BAVENCIO® (avelumab) [Package Insert]. Darmstadt, Germany: Merck KGaA; 2019.
Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global Cancer Statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;68:394-424. <https://onlinelibrary.wiley.com/doi/full/10.3322/caac.21492>.
** Cancer Facts & Figures 2019. *American Cancer Society*. Available at: <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2019/cancer-facts-and-figures-2019.pdf>. Accessed: May 30, 2019.
“Drugs@FDA: FDA Approved Drug Products - Bavencio.” *U.S. Food and Drug Administration*, www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=761049. Accessed: May 28, 2019.
“FDA Approves Avelumab plus Axitinib for Renal Cell Carcinoma.” *U.S. Food and Drug Administration*, 15 May 2019, www.fda.gov/drugs/resources-information-approved-drugs/fda-approves-avelumab-plus-axitinib-renal-cell-carcinoma.
GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.
* “Kidney Cancer Statistics.” *World Cancer Research Fund*, 12 Sept. 2018, www.wcrf.org/dietandcancer/cancer-trends/kidney-cancer-statistics.
*** Protzel C, Maruschke M, Hakenberg OW. Epidemiology, Aetiology, and Pathogenesis of Renal Cell Carcinoma. *European Urology Supplements*. 2012 Aug; 11(3):52-59. <https://www.sciencedirect.com/science/article/abs/pii/S1569905612000309?via%3Dihub>.

Comments Section

On May 14, 2019, FDA approved Bavencio® (avelumab) in combination with Inlyta® (axitinib) for first-line treatment of patients with advanced renal cell carcinoma (RCC).

Renal Cell Carcinoma Prevalence (U.S., 2019): 248,722
Renal Cell Carcinoma Prevalence (Global, 2019): 997,049
It is estimated that there will be 73,820 new cases of kidney and renal pelvis cancers diagnosed in 2019.**
It is estimated that up to 30% of patients with renal cell carcinoma have metastatic disease at the time of diagnosis.***

Sources:
BAVENCIO® (avelumab) [Package Insert]. Darmstadt, Germany: Merck KGaA; 2019.
Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global Cancer Statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;68:394-424. <https://onlinelibrary.wiley.com/doi/full/10.3322/caac.21492>.
** Cancer Facts & Figures 2019. *American Cancer Society*. Available at: <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2019/cancer-facts-and-figures-2019.pdf>. Accessed: May 30, 2019.
“Drugs@FDA: FDA Approved Drug Products - Bavencio.” *U.S. Food and Drug Administration*, www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&AppNo=761049. Accessed: May 28, 2019.
“FDA Approves Avelumab plus Axitinib for Renal Cell Carcinoma.” *U.S. Food and Drug Administration*, 15 May 2019, www.fda.gov/drugs/resources-information-approved-drugs/fda-approves-avelumab-plus-axitinib-renal-cell-carcinoma.
GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.
* “Kidney Cancer Statistics.” *World Cancer Research Fund*, 12 Sept. 2018, www.wcrf.org/dietandcancer/cancer-trends/kidney-cancer-statistics.
*** Protzel C, Maruschke M, Hakenberg OW. Epidemiology, Aetiology, and Pathogenesis of Renal Cell Carcinoma. *European Urology Supplements*. 2012 Aug; 11(3):52-59. <https://www.sciencedirect.com/science/article/abs/pii/S1569905612000309?via%3Dihub>.

Drug Information			Regulatory Information																					
Manufacturer:	Merck		Application Type:	BLA																				
Drug Brand Name:	Bavencio®		Original Anticipated Approval (PDUFA):	8/27/2017																				
			Regulatory Status:	Approved																				
Drug Generic Name:	avelumab		Regulatory Status Date:	5/9/2017																				
			Regulatory Status Reason:	N/A																				
Drug Type:	Monoclonal Antibody		Orphan Drug Designation:	N/A																				
			FDA Fast Track Designation:	N/A																				
Route of Administration:	Intravenous		Breakthrough Therapy Designation	N/A																				
			Priority Review Designation:	2/28/2017																				
Indication Details			Sales Forecast																					
Indication	Incidence Type	Incidence	<div><div><div></div></div><div><div></div></div></div> <div><div></div></div> <div>Bavencio (Merck KGaA), Global, Forecast, USD Millions</div> <div><div></div></div>  <table><thead><tr><th>Year</th><th>Sales Value</th></tr></thead><tbody><tr><td>2017</td><td>24</td></tr><tr><td>2018</td><td>78</td></tr><tr><td>2019</td><td>127</td></tr><tr><td>2020</td><td>217</td></tr><tr><td>2021</td><td>312</td></tr><tr><td>2022</td><td>397</td></tr><tr><td>2023</td><td>472</td></tr><tr><td>2024</td><td>539</td></tr><tr><td>2025</td><td>614</td></tr></tbody></table>		Year	Sales Value	2017	24	2018	78	2019	127	2020	217	2021	312	2022	397	2023	472	2024	539	2025	614
Year	Sales Value																							
2017	24																							
2018	78																							
2019	127																							
2020	217																							
2021	312																							
2022	397																							
2023	472																							
2024	539																							
2025	614																							
Metastatic Transitional (Urothelial) Tract Cancer	U.S.	80,470																						
	Global	456,819																						

Source: GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.

Source: GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.

Comments Section

On May 9, 2017, FDA approved Bavencio® (avelumab) for the treatment of patients with locally advanced or metastatic urothelial carcinoma (UC) who have disease progression during or following platinum-containing chemotherapy, or who have disease progression within 12 months of neoadjuvant or adjuvant treatment with platinum-containing chemotherapy.

This indication was approved under accelerated approval based on tumor response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials.

Sources:

BAVENCIO® (avelumab) [Package Insert]. Darmstadt, Germany: Merck KGaA; 2019.

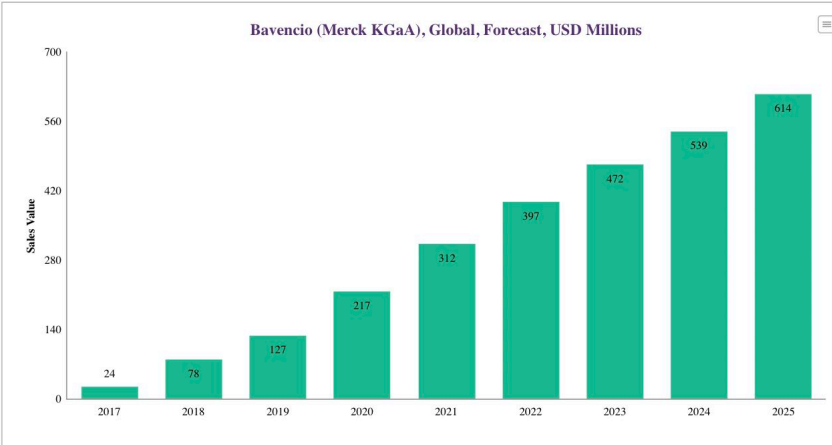
"Drugs@FDA: FDA Approved Drug Products - Bavencio." U.S. Food and Drug Administration,

www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=761049. Accessed: May 28, 2019.

"FDA Grants Accelerated Approval to Avelumab for Urothelial Carcinoma." U.S. Food and Drug Administration, 9 May 2017, www.fda.gov/drugs/resources-information-approved-drugs/fda-grants-accelerated-approval-avelumab-urothelial-carcinoma.

GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.

SEER Cancer Stat Facts: Bladder Cancer. National Cancer Institute. Bethesda, MD, <https://seer.cancer.gov/statfacts/html/urinb.html>. Accessed: May 30, 2019.

Drug Information			Regulatory Information																					
Manufacturer:	Merck		Application Type:	BLA																				
Drug Brand Name:	Bavencio®		Original Anticipated Approval (PDUFA):	5/29/2017																				
			Regulatory Status:	Approved																				
Drug Generic Name:	avelumab		Regulatory Status Date:	3/23/2017																				
			Regulatory Status Reason:	N/A																				
Drug Type:	Monoclonal Antibody		Orphan Drug Designation:	9/21/2015																				
			FDA Fast Track Designation:	10/7/2015																				
Route of Administration:	Intravenous		Breakthrough Therapy Designation	11/18/2015																				
			Priority Review Designation:	11/29/2016																				
Indication Details			Sales Forecast																					
Indication	Incidence Type	Incidence	 <p>Bavencio (Merck KGaA), Global, Forecast, USD Millions</p> <table><thead><tr><th>Year</th><th>Sales Value (USD Millions)</th></tr></thead><tbody><tr><td>2017</td><td>24</td></tr><tr><td>2018</td><td>78</td></tr><tr><td>2019</td><td>127</td></tr><tr><td>2020</td><td>217</td></tr><tr><td>2021</td><td>312</td></tr><tr><td>2022</td><td>397</td></tr><tr><td>2023</td><td>472</td></tr><tr><td>2024</td><td>539</td></tr><tr><td>2025</td><td>614</td></tr></tbody></table> <p>Source: GlobalData, Pharma Intelligence Center. https://pharma.globaldata.com, Accessed: May 28, 2019.</p>		Year	Sales Value (USD Millions)	2017	24	2018	78	2019	127	2020	217	2021	312	2022	397	2023	472	2024	539	2025	614
Year	Sales Value (USD Millions)																							
2017	24																							
2018	78																							
2019	127																							
2020	217																							
2021	312																							
2022	397																							
2023	472																							
2024	539																							
2025	614																							
Merkel Cell Carcinoma	U.S.	2,000 / yr																						
	Global	0.6 / 100,000 / yr																						

Comments Section

On March 23, 2017, FDA approved Bavencio® (avelumab) for the treatment of adults and pediatric patients 12 years and older with metastatic Merkel cell carcinoma (MCC).

This indication was approved under accelerated approval based on tumor response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials.

Sources:
“Avelumab (BAVENCIO).” *U.S. Food and Drug Administration*, 30 May 2017, www.fda.gov/drugs/resources-information-approved-drugs/avelumab-bavencio.
BAVENCIO® (avelumab) [Package Insert]. Darmstadt, Germany: Merck KGaA; 2019.
“Drugs@FDA: FDA Approved Drug Products - Bavencio.” *U.S. Food and Drug Administration*, www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=761049. Accessed: May 28, 2019.
GlobalData, Pharma Intelligence Center. <https://pharma.globaldata.com>, Accessed: May 28, 2019.
Hughes MP, Hardee ME, Cornelius LA, Hutchins LF, Becker JC, Gao L. Merkel Cell Carcinoma: Epidemiology, Target, and Therapy. *Curr Dermatol Rep*. 2014; 3(1): 46–53.
“Key Statistics for Merkel Cell Carcinoma.” *American Cancer Society*. 9 Oct. 2018. www.cancer.org/cancer/merkel-cell-skin-cancer/about/key-statistics.html.