Third Quarter 2018

Financial Results and Business Update

October 23, 2018

Biogen

Forward-Looking Statements

This presentation contains forward-looking statements, including statements relating to: our strategy and plans; potential of our commercial business and pipeline programs; capital allocation and investment strategy; clinical trials and data readouts and presentations; regulatory filings and the timing thereof; risks and uncertainties associated with drug development and commercialization; anticipated benefits and potential of investments, collaborations, and business development activities; the anticipated timing to complete certain transactions; and our future financial and operating results. These forward-looking statements may be accompanied by such words as "aim," "anticipate," "believe," "could," "estimate," "expect," "forecast," "goal," "intend," "may," "plan," "potential," "possible," "will," and other words and terms of similar meaning. Drug development and commercialization involve a high degree of risk, and only a small number of research and development programs result in commercialization of a product. Results in early stage clinical trials may not be indicative of full results or results from later stage or larger scale clinical trials and do not ensure regulatory approval. You should not place undue reliance on these statements or the scientific data presented.

These statements involve risks and uncertainties that could cause actual results to differ materially from those reflected in such statements, including: our dependence on revenues from our principal products; failure to compete effectively due to significant product competition in the markets for our products; difficulties in obtaining and maintaining adequate coverage, pricing and reimbursement for our products; the occurrence of adverse safety events, restrictions on use with our products, or product liability claims; failure to protect and enforce our data, intellectual property and other proprietary rights, and the risks and uncertainties relating to intellectual property claims and challenges; uncertainty of long-term success in developing, licensing, or acquiring other product candidates or additional indications for existing products; the risk that positive results in a clinical trial may not be replicated in subsequent or confirmatory trials or success in early stage clinical trials may not be predictive of results in later stage or large scale clinical trials or trials in other potential indications; risks associated with clinical trials, including our ability to adequately manage clinical activities, unexpected concerns that may arise from additional data or analysis obtained during clinical trials, regulatory authorities may require additional information or further studies, or may fail to approve or may delay approval of our drug candidates; risks associated with current and potential future healthcare reforms; problems with our manufacturing processes; risks relating to technology failures or breaches; our dependence on collaborators and other third parties for the development, regulatory approval, and commercialization of products and other aspects of our business, which are outside of our full control; failure to successfully execute on our growth initiatives; risks relating to management and key personnel changes, including attracting and retaining key personnel; risks relating to investment in and expansion of manufacturing capacity for future clinical and commercial requirements; failure to comply with legal and regulatory requirements; fluctuations in our effective tax rate; the risks of doing business internationally, including currency exchange rate fluctuations; risks related to commercialization of biosimilars; risks related to investment in properties; the market, interest, and credit risks associated with our portfolio of marketable securities; risks relating to stock repurchases; risks relating to access to capital and credit markets; risks related to indebtedness; environmental risks; risks relating to the sale and distribution by third parties of counterfeit versions of our products; risks relating to the use of social media for our business; change in control provisions in certain of our collaboration agreements; risks relating to the spin-off of our hemophilia business, including risks of operational difficulties and exposure to claims and liabilities; and the other risks and uncertainties that are described in the Risk Factors section of our most recent annual or quarterly report and in other reports we have filed with the Securities and Exchange Commission.

These statements are based on our current beliefs and expectations and speak only as of the date of this presentation. We do not undertake any obligation to publicly update any forward-looking statements.

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Q3 2018 Earnings Call Agenda

Introduction	**Matt Calistri** VP, Investor Relations
Overview	**Michel Vounatsos** Chief Executive Officer
R&D Update	**Michael Ehlers, M.D., Ph.D.** EVP, Research & Development
Financial Update	**Jeffrey Capello** EVP, Chief Financial Officer
Closing Remarks	**Michel Vounatsos** Chief Executive Officer
Available for Q&A	**Al Sandrock, M.D., Ph.D.** EVP, Chief Medical Officer

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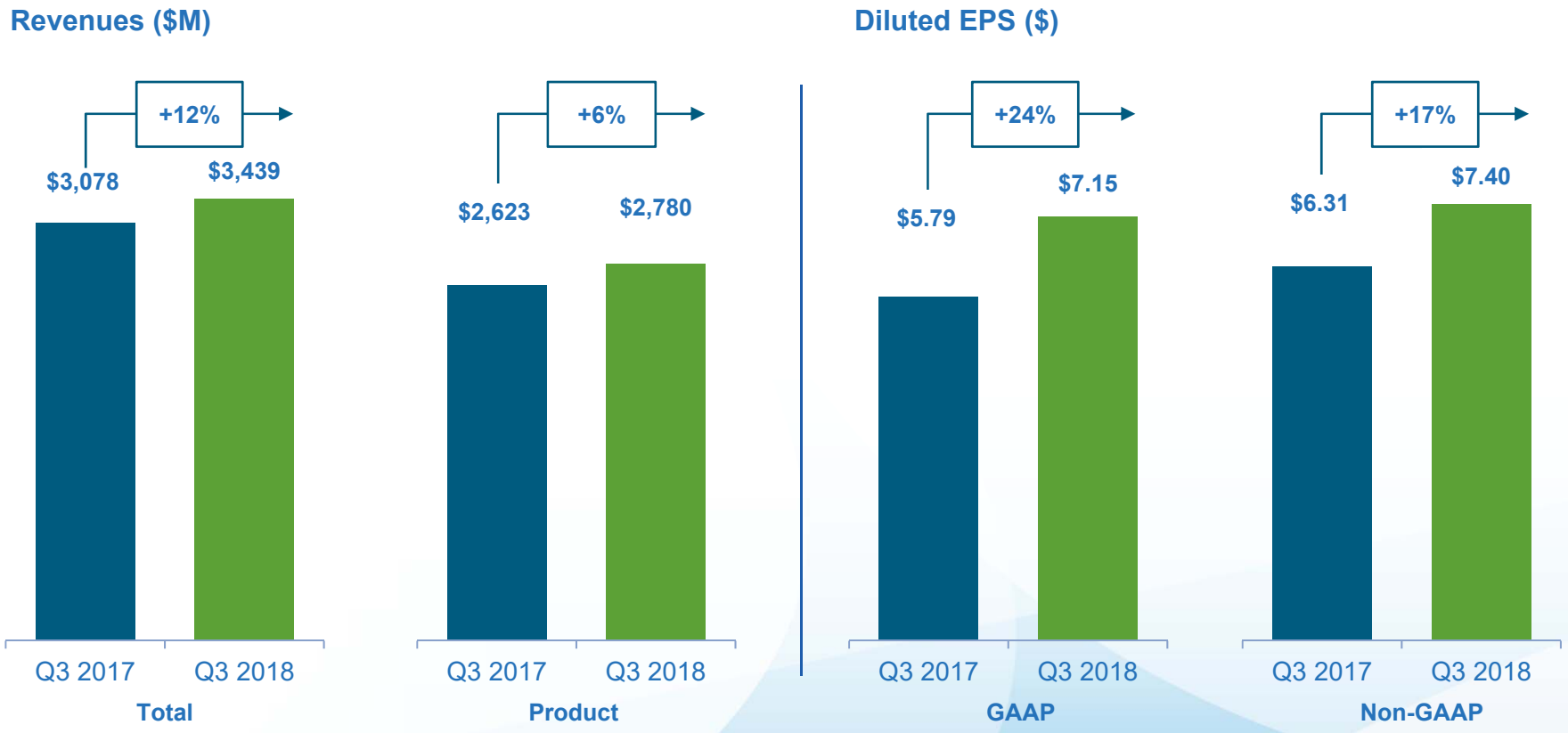
Overview

Michel Vounatsos

Chief Executive Officer

Strong Performance in Q3 2018



A reconciliation of our GAAP to Non-GAAP financial results is at the end of this presentation.

Strong Progress Implementing Strategy

Maximizing the resilience of our MS core business	✓ Stable revenues, including OCREVUS royalties, in Q3 versus prior year ✓ Stable global MS patients in Q3 versus prior year ✓ Improved year-over-year trends for TECFIDERA and TYSABRI in U.S.
Accelerating progress in spinal muscular atrophy	✓ Q3 revenue performance driven by growth in both U.S. and ex-U.S. ✓ Close to 6,000 patients on therapy globally as of Q3 2018 ✓ NURTURE data showed many presymptomatic infants treated with SPINRAZA achieved milestones consistent with normal development
Developing and expanding our neuroscience portfolio	✓ Completed enrollment for opicinumab Phase 2b study in MS and BIIB092 Phase 2 study in progressive supranuclear palsy ✓ Initiated Phase 1 study of BIIB078 in ALS and Phase 2b study of BG00011 (STX-100) in idiopathic pulmonary fibrosis
Re-prioritizing our capital allocation efforts	✓ Year-to-date, completed five business development transactions ✓ Repurchased 10.5 million shares year-to-date ✓ Board authorized new $3.5 billion share repurchase program in Q3
Creating a leaner and simpler operating model	✓ Actively implementing an innovative operating model designed for the future

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R&D Update

Michael Ehlers, M.D., Ph.D.
EVP, Research & Development

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Industry-Leading Alzheimer's Disease Portfolio

Presentations at Clinical Trials on Alzheimer's Disease (CTAD)

- ✓ Biogen will present updated safety and efficacy analyses of aducanumab from the Phase 1b PRIME study
- ✓ Eisai will present updates from the Phase 2 study of BAN2401 and safety and efficacy data from the Phase 2 study of elenbecestat

Aducanumab (anti-Aβ mAb)

- ✓ Planning to initiate EVOLVE, a Phase 2 study designed to assess the clinical relevance of asymptomatic ARIA

Programs Targeting Tau

- ✓ Advancing BIIB076 and BIIB092, both anti-tau antibodies, as well as BIIB080, an antisense oligonucleotide targeting tau production
- ✓ BIIB076 Phase 1 data expected early 2020

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Aducanumab, BAN2401, and elenbecestat are being developed in collaboration with Eisai.

Expanding Leadership Position in Multiple Sclerosis

Opicinumab (anti-LINGO-1 mAb)

- ✓ Completed enrollment of AFFINITY, a Phase 2b study of opicinumab as an add-on therapy to disease-modifying therapies for RRMS
- ✓ Enrollment of AFFINITY was completed approximately seven months ahead of schedule; data expected in mid-2020

Diroximel fumarate (BIIB098)

- ✓ Currently enrolling patients in Part B of the head-to-head tolerability study versus TECFIDERA, with data expected in mid-2019
- ✓ Alkermes expects to file an NDA with the FDA by the end of this year, potentially positioning us for a U.S. approval by early 2020

Presentations at ECTRIMS

- ✓ Clinical benefits of TECFIDERA in newly diagnosed patients were maintained throughout nine years of continuous treatment
- ✓ TYSABRI Observational Program data reinforced the long-term safety and consistent effectiveness of TYSABRI over 10 years

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BIIB098 is being developed in collaboration with Alkermes.

Building Depth in Movement Disorders

BIIB092 (anti-tau mAb)

- ✓ Completed enrollment of a Phase 2 study of BIIB092 in PSP
- ✓ Granted fast track designation by the FDA; results expected in the second half of 2019

BIIB054 (anti-α-synuclein mAb)

- ✓ Highly selective for aggregated forms of α-synuclein as compared to the more abundant monomer
- ✓ Currently enrolling a Phase 2 study in Parkinson's disease

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Efficacy Profile of SPINRAZA

Bolstered by New Results from NURTURE

NURTURE: an ongoing open-label, single-arm efficacy and safety study of SPINRAZA in presymptomatic infants with genetically diagnosed SMA

- ✓ As of May 2018 all patients in the study were alive and none required tracheostomy or permanent ventilation
- ✓ 22 of 25 participants were able to walk either with assistance or independently according to the motor milestone standard of the World Health Organization, and all were able to sit without support
- ✓ Assessment of bulbar function revealed that 22 of 25 patients achieved a maximal score on the Hammersmith Infant Neurological Examination Section 1 evaluation of the ability to suck and swallow

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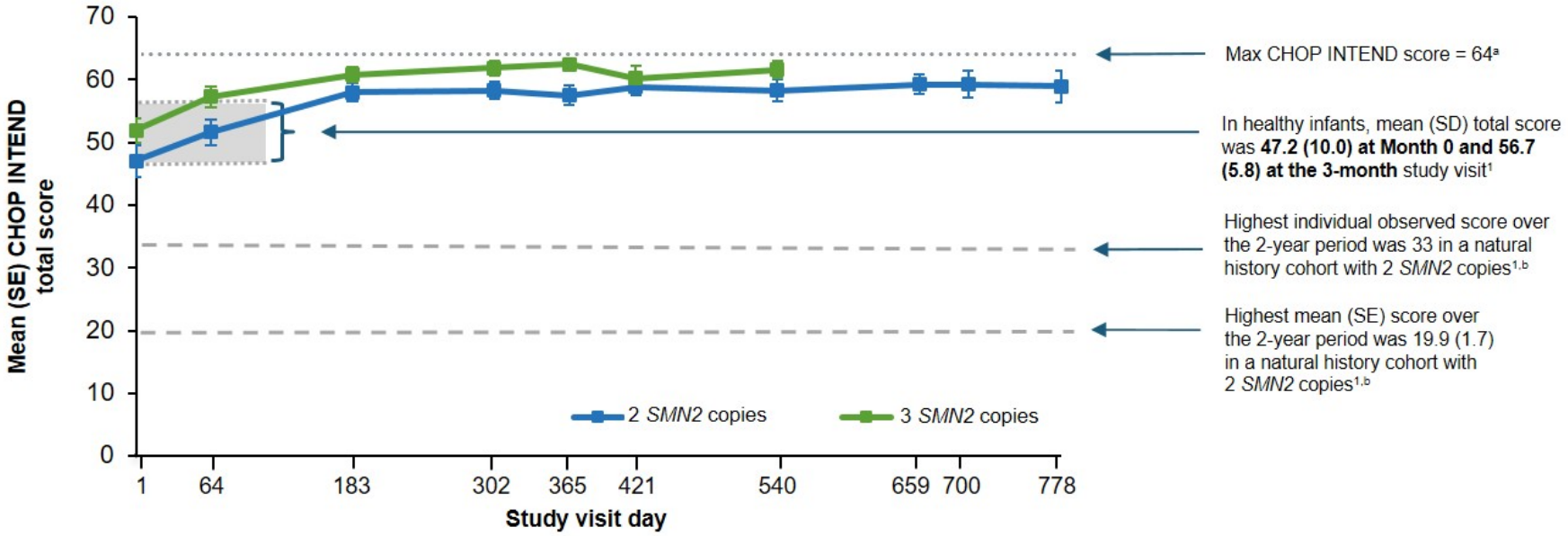
Efficacy Profile of SPINRAZA

Bolstered by New Results from NURTURE

CHOP INTEND: 64-point scale of motor function



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NURTURE study interim analysis data cutoff date: May 15, 2018. Time points with n≥5 included. [a]Per version 6 of the study protocol, CHOP INTEND was assessed in participants until they have a maximum score of 64. Once a score of 64 is achieved, CHOP INTEND will no longer be assessed. [b]Infants were aged ≤6 months at enrollment, born between 36 and 42 weeks' gestation, and had genetically confirmed SMA; infants were excluded if they required noninvasive ventilatory support for >12 hours/day, had a comorbid illness, or were enrolled in a SMA clinical trial. 1. Kolb SJ, *et al*; NeuroNEXT Clinical Trial Network on behalf of the NN101 SMA Biomarker Investigators. *Ann Neurol*. 2017;82(6):883-891.

Targeting Genetic Causes of ALS

BIIB067 (SOD1 ASO)

- ✓ Continue to progress our Phase 1 study of BIIB067 in ALS patients who harbor mutations in superoxide dismutase 1, or SOD1

BIIB078 (C9orf72 ASO)

- ✓ Dosed the first patient in the Phase 1 trial of BIIB078 in ALS patients harboring hexanucleotide repeat expansion in C9orf72
- ✓ Selectively targets C9orf72 transcripts that contain hexanucleotide repeat expansions for degradation

Biogen has an option to license BIIB067 and BIIB078 from Ionis Pharmaceuticals.

Updates on Emerging Growth Areas

BIIB093 (IV glibenclamide)

- ✓ Dosed the first patient in CHARM, the Phase 3 trial of BIIB093 for the prevention and treatment of cerebral edema associated with large hemispheric infarction

Vixotrigine (BIIB074)

- ✓ Phase 2b study in painful lumbosacral radiculopathy did not meet primary or secondary efficacy endpoints
- ✓ Safety data were consistent with the safety profile reported in previous studies
- ✓ Delaying the initiation of Phase 3 studies in trigeminal neuralgia

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Progress on Legacy Programs

Dapirolizumab pegol (anti-CD40L)

- ✓ Phase 2b study in adults with moderately-to-severely active systemic lupus erythematosus did not achieve primary endpoint (p=0.06)
- ✓ Study demonstrated consistent and potentially meaningful improvements for the majority of clinical endpoints
- ✓ Evidence of proof of biology was observed and molecule demonstrated an acceptable safety profile

BG00011 (anti-αvβ6 integrin mAb)

- ✓ Dosed the first patient in the Phase 2b study of BG00011 in participants with idiopathic pulmonary fibrosis, or IPF
- ✓ BG00011 previously demonstrated compelling proof of biology via a substantial downregulation of the TGF-β pathway in IPF patients

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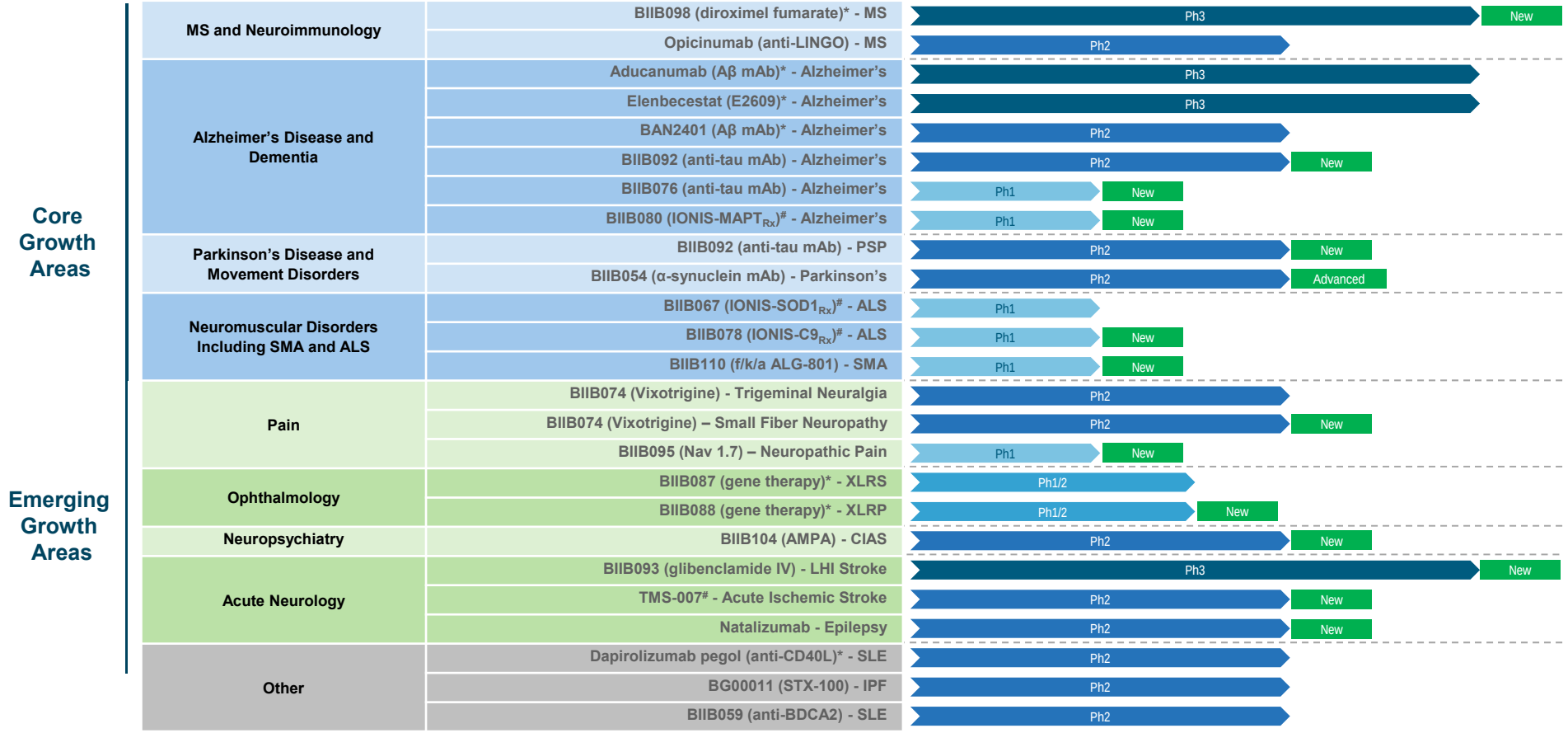
Added or Advanced 15 Clinical Programs Since Beginning of 2017



* Collaboration programs # Option agreement

Financial Update

Jeffrey Capello

EVP, Chief Financial Officer

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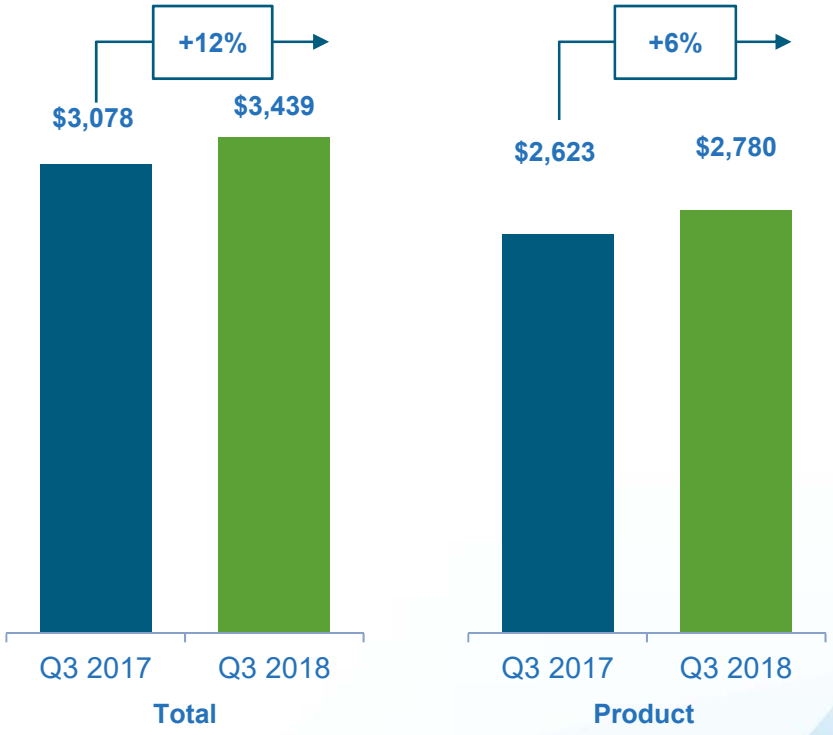
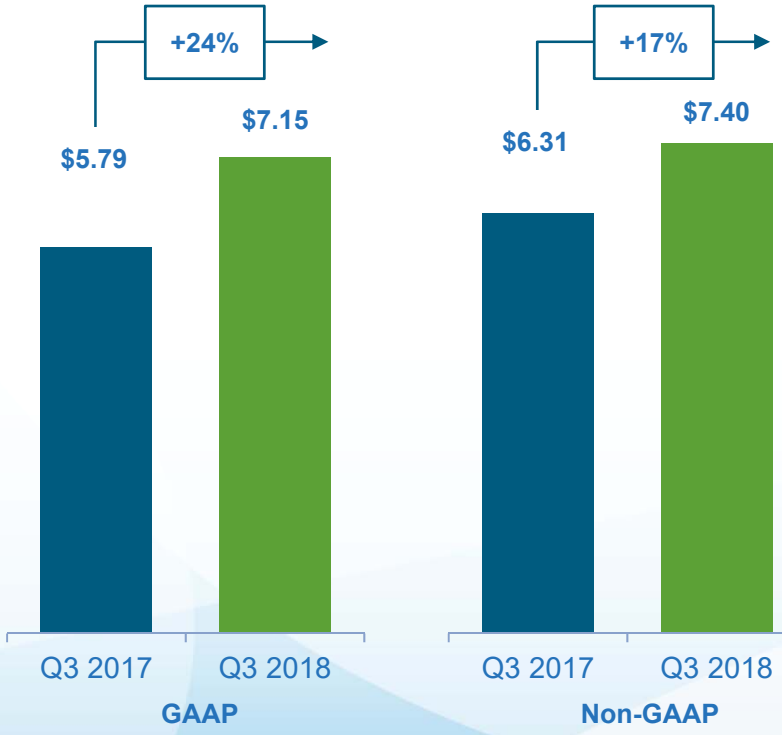
Strong Performance in Q3 2018

Revenues ($M)



Diluted EPS ($)



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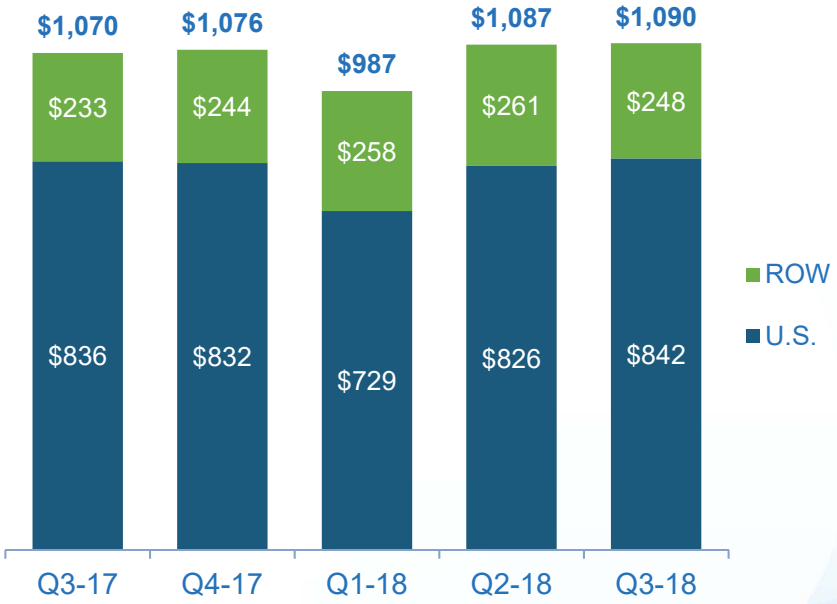
Global TECFIDERA Performance

Tecfidera (dimethyl fumarate) delayed-release capsules

Most Prescribed Oral MS Therapy Globally

TECFIDERA Revenues ($M)



Q3 2018 Highlights

- Revenues vs. Q3 2017 and Q2 2018

	ΔY/Y		ΔQ/Q
WW	+ 2%	and	+ 0%
U.S.	+ 1%	and	+ 2%
ROW	+ 6%	and	- 5%

- U.S. revenues relatively stable year-over-year following declines in Q1 2018 and Q2 2018
- Patient growth versus Q3 2017 in each large European market
- Over 25% market share in Japan

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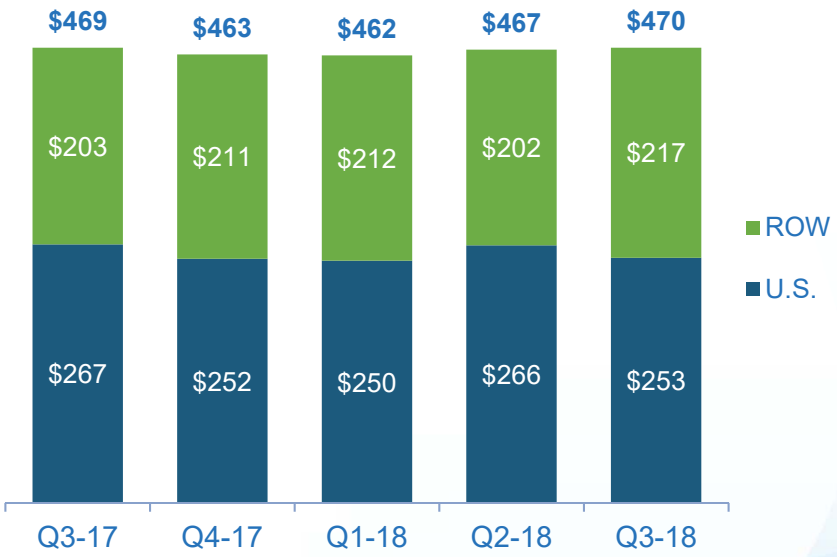
Numbers may not foot due to rounding.

Global TYSABRI Performance

TYSABRI (natalizumab)

Market Leading High Efficacy Therapy for MS Globally

TYSABRI Revenues ($M)



Q3 2018 Highlights

- Revenues vs. Q3 2017 and Q2 2018

	ΔY/Y		ΔQ/Q
WW	+ 0%	and	+ 1%
U.S.	- 5%	and	- 5%
ROW	+ 7%	and	+ 8%

- Positive patient growth versus Q3 2017 in all major European markets except Germany
- Double-digit patient growth in emerging markets

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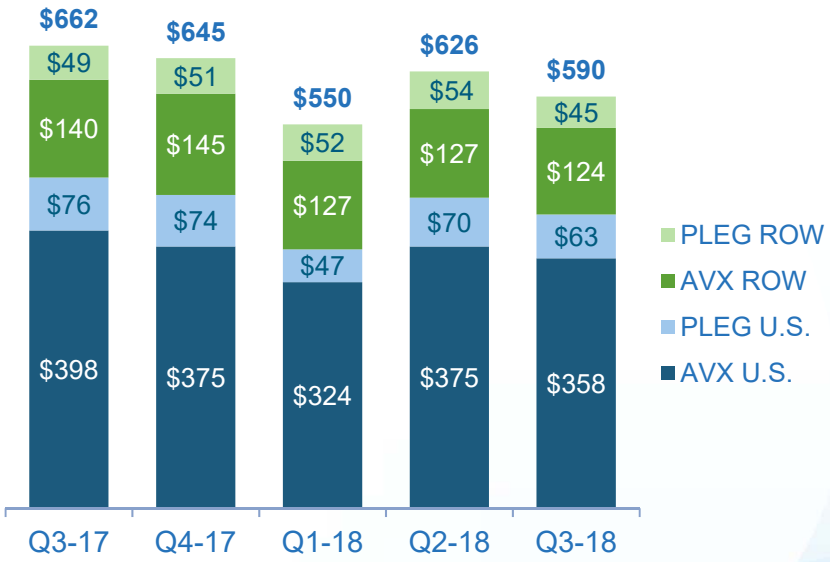
Numbers may not foot due to rounding.

Global Interferon Performance

AVONEX (interferon beta-1a) plegridy (peginterferon beta-1a)

Market Leading Interferon Franchise for MS Globally

Interferon Revenues ($M)



Q3 2018 Highlights

- Revenues vs. Q3 2017 and Q2 2018

	ΔY/Y		ΔQ/Q
WW	- 11%	and	- 6%
U.S.	- 11%	and	- 5%
ROW	- 11%	and	- 7%

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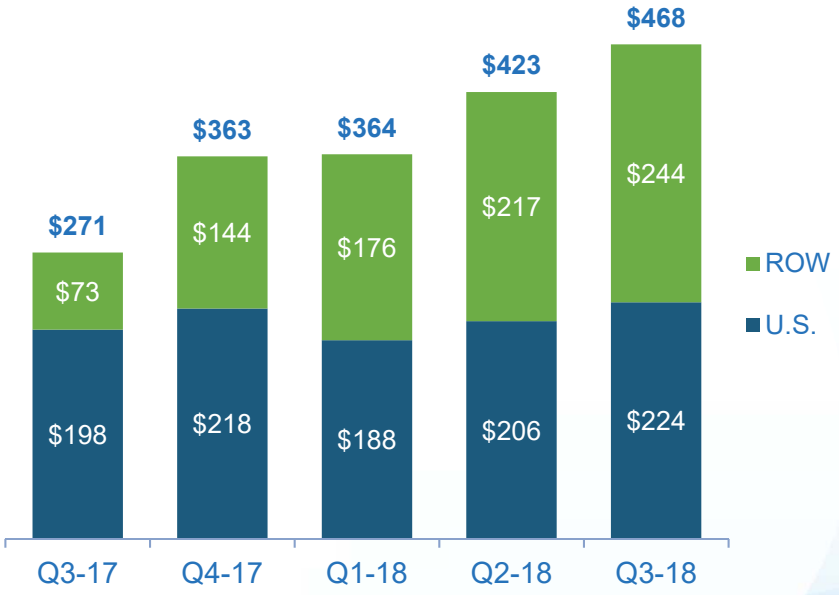
Numbers may not foot due to rounding.

Global SPINRAZA Performance

SPINRAZA (nusinersen) injection 12 mg/5 mL

Strong Global Launch Continues

SPINRAZA Revenues ($M)



Dosing Schedule

Highlights

- Received regulatory approval in an additional five countries and filed for approval in two more countries
- Secured formal reimbursement in an additional four countries
- Formal reimbursement in 28 countries as of October 19, 2018
- Recorded revenue from over 30 international markets; ~ 75% of ex-U.S. SPINRAZA revenues in Q3 2018 from Germany, Italy, Japan, Brazil, Spain, France, and Australia

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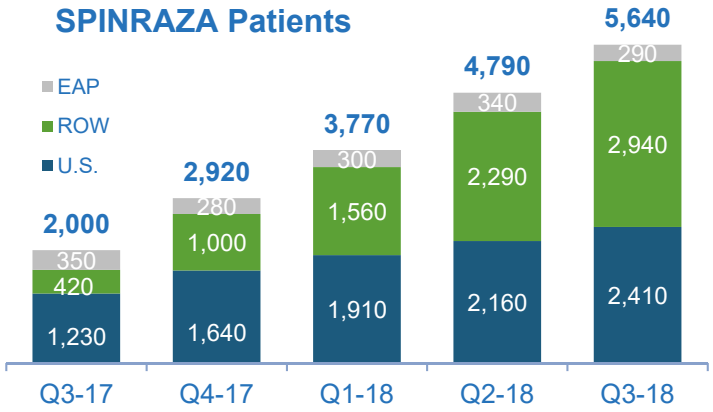
Numbers may not foot due to rounding.

SPINRAZA Patient Dynamics



U.S. Patient Dynamics	Q3-17	Q4-17	Q1-18	Q2-18	Q3-18
Total patients	1,230	1,640	1,910	2,160	2,410
New patient starts	520	420	290	270	260
Average doses per patient	1.8	1.5	1.2	1.1	1.1
% Loading doses	90%	75%	60%	45%	40%
% Maintenance doses	10%	25%	40%	55%	60%
% Free doses	20%	20%	20%	15%	15%

Highlights

- As of September 30, 2018, ~ 6,000 patients on therapy across the post-marketing setting, the EAP and clinical trials
- Low discontinuations, mostly due to mortality
- > 20% increase in adults on therapy in the U.S. versus Q2 2018
  - > 50% of new patient starts in Q3 2018 were adults
- ~ 50% of infant (< 2 years old), ~ 50% of pediatric (2-17), and ~ 15% of adult (18+) SMA patients are on therapy in the U.S.

SMA Prevalence Assumptions:

- ~ 9,000 patients in the U.S.
- ~ 10,000 patients in Europe
- ~ 1,000 patients in Japan
- ~ 5% infants
- ~ 35% pediatric patients
- ~ 60% adults

Numbers may not foot due to rounding. U.S. and Ex-U.S. SPINRAZA patients represent the total estimated number of patients on therapy in the post-marketing setting as of the end of each quarter, including free patients in the U.S. EAP patients represent patients actively enrolled in the Expanded Access Program (EAP) as of the end of each quarter. As of the end of Q3 2018, there were an additional ~ 300 patients enrolled in ongoing clinical studies.

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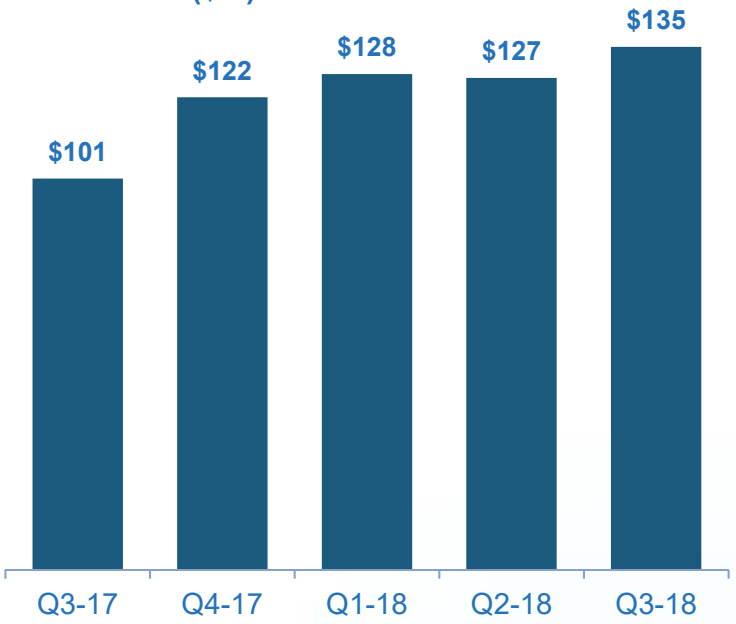
SPINRAZA (nusinersen) injection 12 mg/5 mL

Biosimilars Business

SAMSUNG BIOEPIS

BENEPALI and FLIXABI Revenues ($M)



COMMERCIALIZATION IN EUROPE

- > 100,000 patients currently on Biogen biosimilars*
- IMRALDI launched in Europe on October 17, 2018
- Biogen is now able to offer biosimilars of all three major anti-TNFs in Europe

Benepali® Etanercept

Flixabi® Infliximab

Imraldi® Adalimumab

SAMSUNG BIOEPIS JOINT VENTURE

- Leveraging expertise in protein engineering and biologics manufacturing
- Advancing biosimilars of trastuzumab and bevacizumab

Biogen. * Biogen data on file.

Q3 2018 Financial Results Summary: Revenues

$ in Millions	Q3 2018	Q3 2017	Q2 2018	Δ Y/Y	Δ Q/Q
Total MS Product Revenues[1]	$2,173	$2,239	$2,203	(3%)	(1%)
SPINRAZA U.S.	$224	$198	$206	13%	9%
SPINRAZA ROW	$244	$73	$217	223%	12%
Total SPINRAZA Revenues	$468	$271	$423	73%	11%
Biosimilars Revenues	$135	$101	$127	33%	6%
FUMADERM Revenues	$5	$11	$6	(55%)	(13%)
Total Product Revenues[1]	$2,780	$2,623	$2,758	6%	1%
RITUXAN/GAZYVA Revenues	$375	$342	$377	10%	(1%)
OCREVUS Royalties	$137	$65	$113	112%	21%
Revenues from Anti-CD20 Therapeutic Programs	$512	$406	$490	26%	4%
Other Revenues	$147	$49	$109	202%	36%
Total Revenues[1]	**$3,439**	**$3,078**	**$3,357**	**12%**	**2%**

Numbers may not foot due to rounding. Percent changes represented as favorable & (unfavorable). For all periods, there were no adjustments between GAAP and Non-GAAP revenues.

[1] Net of Hedge

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Q3 2018 Financial Results Summary

$ in Millions	Q3 2018	Q3 2017	Q2 2018	ΔY/Y	ΔQ/Q
GAAP Cost of Sales	$461	$370	$421	(25%)	(9%)
% of Total Revenues	13%	12%	13%		
Non-GAAP Cost of Sales	$461	$370	$421	(25%)	(9%)
% of Total Revenues	13%	12%	13%		
GAAP R&D Expenses	$508	$446	$981	(14%)	48%
% of Total Revenues	15%	15%	29%		
Non-GAAP R&D Expenses	$508	$446	$819	(14%)	38%
% of Total Revenues	15%	15%	24%		
GAAP SG&A Expenses	$498	$433	$516	(15%)	4%
% of Total Revenues	14%	14%	15%		
Non-GAAP SG&A Expenses	$495	$433	$512	(14%)	3%
% of Total Revenues	14%	14%	15%		
GAAP Amortization of Acquired Intangibles	$282	$109	$107	(159%)	(162%)
Collaboration Profit Sharing	$47	$35	$39	(35%)	(21%)

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Q3 2018 Financial Results Summary

$ in Millions except EPS, Shares in Millions	Q3 2018	Q3 2017	Q2 2018	Δ Y/Y	Δ Q/Q
GAAP Other Income (Expense)	$115	($44)	($35)	NMF	NMF
Non-GAAP Other Income (Expense)	($26)	($44)	($40)	41%	35%
GAAP Tax Rate	20%	24%	22%		
Non-GAAP Tax Rate	21%	24%	21%		
GAAP Net Income (Loss) Attributable to Noncontrolling Interests	($2)	$0	$48	NMF	NMF
Non-GAAP Net Income (Loss) Attributable to Noncontrolling Interests	$0	$0	($0)	NMF	NMF
Weighted average diluted shares used in calculating diluted EPS	202	212	207	5%	3%
GAAP Net Income Attributable to Biogen Inc.	$1,444	$1,226	$867	18%	67%
GAAP EPS	$7.15	$5.79	$4.18	24%	71%
Non-GAAP Net Income Attributable to Biogen Inc.	$1,494	$1,337	$1,202	12%	24%
Non-GAAP EPS	$7.40	$6.31	$5.80	17%	28%

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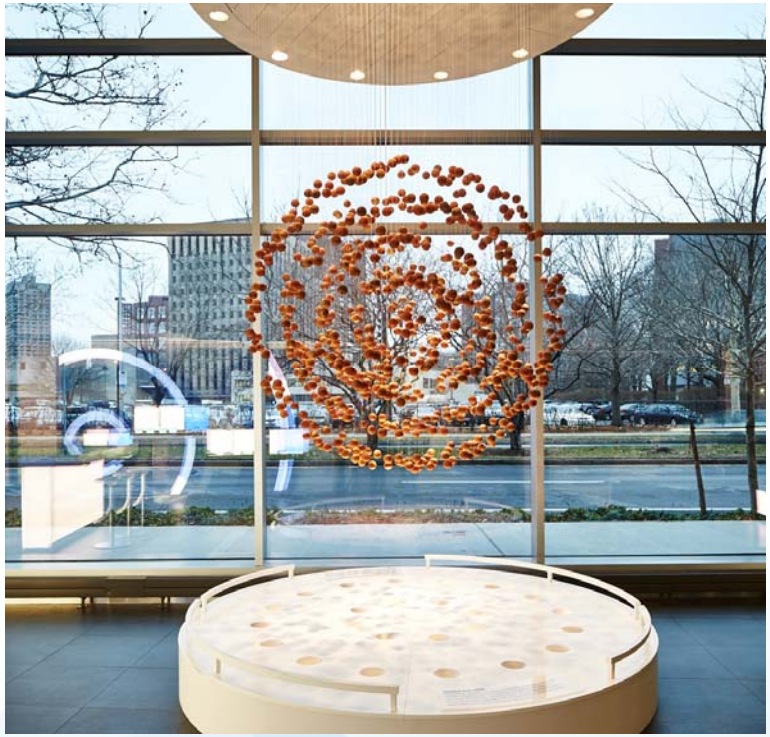
Closing Remarks

Michel Vounatsos

Chief Executive Officer



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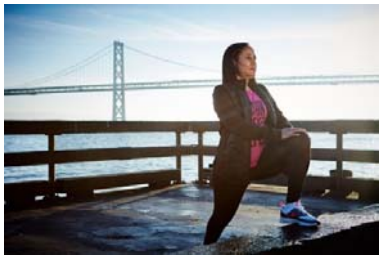
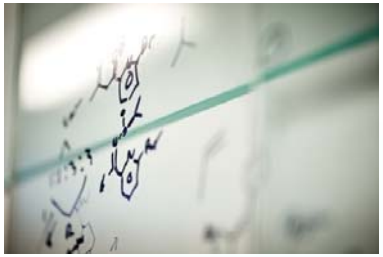
Expected Pipeline Progress Over the Next 12-18 Months

	Expected Milestone
MS and Neuroimmunology	• **BIIB098** NDA filing with FDA and head-to-head data
Alzheimer's Disease/Dementia	• **Aducanumab, BAN2401, and elenbecestat data** presentations at CTAD 2018 • Phase 1 data for anti-tau antibody **BIIB076** • Final Phase 3 data for **aducanumab**
Neuromuscular Disorders	• Phase 1 data for **BIIB067** in ALS
Movement Disorders	• Phase 2 data for **BIIB092** in PSP
Ophthalmology	• Phase 1/2 data for **BIIB087** in x-linked retinoschisis

Questions & Answers



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Appendix

Q3 2018 Financial Results Summary: Revenues

$ in Millions	Q3 2018	Q3 2017	Q2 2018	Δ Y/Y	Δ Q/Q
TECFIDERA U.S.	$842	$836	$826	1%	2%
TECFIDERA ROW[1]	$248	$233	$261	6%	(5%)
Total TECFIDERA Revenues[1]	$1,090	$1,070	$1,087	2%	0%
AVONEX U.S .	$358	$398	$375	(10%)	(4%)
AVONEX ROW[1]	$124	$140	$127	(11%)	(2%)
Total AVONEX Revenues[1]	$482	$538	$502	(10%)	(4%)
PLEGRIDY U.S.	$63	$76	$70	(17%)	(9%)
PLEGRIDY ROW[1]	$45	$49	$54	(8%)	(17%)
Total PLEGRIDY Revenues[1]	$108	$124	$124	(13%)	(13%)
Total Interferon Revenues[1]	$590	$662	$626	(11%)	(6%)
TYSABRI U.S.	$253	$267	$266	(5%)	(5%)
TYSABRI ROW[1]	$217	$203	$202	7%	8%
Total TYSABRI Revenues[1]	$470	$469	$467	0%	1%
FAMPYRA[1]	$23	$24	$23	(7%)	(2%)
ZINBRYTA ROW	$0	$14	$0	(100%)	NMF
Total MS Product Revenues[1]	**$2,173**	**$2,239**	**$2,203**	**(3%)**	**(1%)**
OCREVUS Royalties	$137	$65	$113	112%	21%
MS Product Revenues[1] + OCREVUS Royalties	**$2,310**	**$2,304**	**$2,316**	**0%**	**(0%)**

Numbers may not foot due to rounding. Percent changes represented as favorable & (unfavorable). For all periods, there were no adjustments between GAAP and Non-GAAP revenues.
[1] Net of Hedge

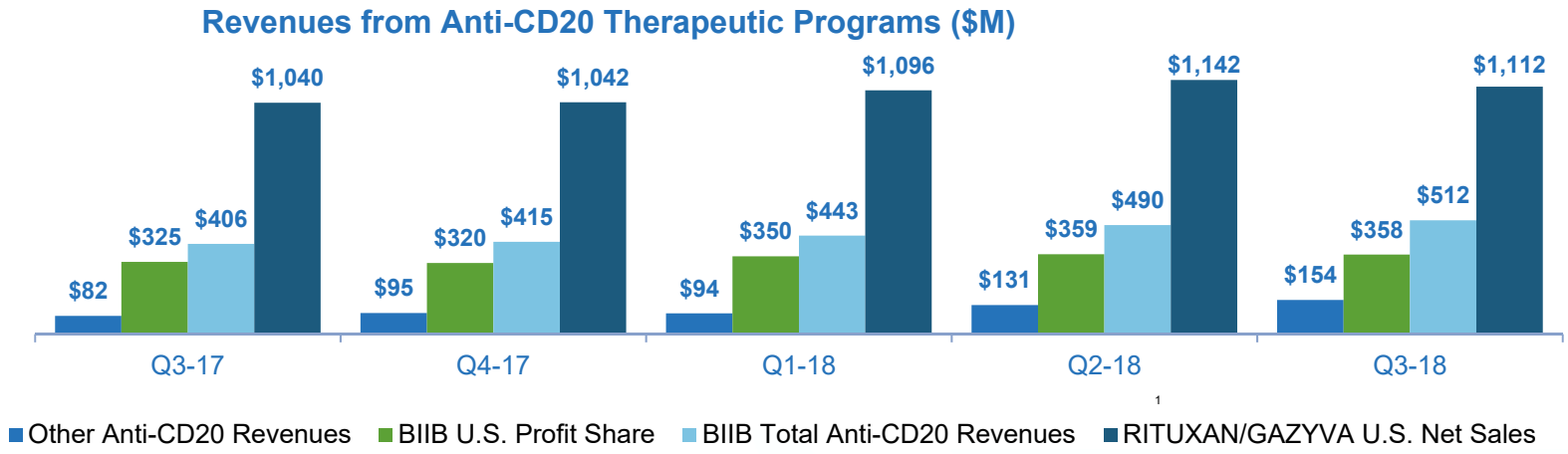
Q3 2018 Impact of Foreign Exchange and Hedging

	Actuals	Hedge Gains (Losses) in the Quarter			FX Impact w/o Hedge Favorable / (Unfavorable)		Hedge Impact Favorable/ (Unfavorable)		Total Impact Favorable/ (Unfavorable)	
	Q3'18	Q3'18	Q3'17	Q2'18	Vs. Q3'17	Vs. Q2'18	Vs. Q3'17	Vs. Q2'18	Vs. Q3'17	Vs. Q2'18
Total Revenues	**$3,439**	**($8)**	**($19)**	**($2)**	**($18)**	**($32)**	**$11**	**($6)**	**($8)**	**($38)**
TECFIDERA	$1,090	($3)	($7)	($1)	($4)	($7)	$4	($3)	$0	($10)
Interferon	$590	($2)	($5)	($1)	($4)	($5)	$3	($1)	($0)	($7)
TYSABRI	$470	($2)	($6)	($1)	($5)	($6)	$3	($1)	($2)	($8)
SPINRAZA	$468	N/A	N/A	N/A	($3)	($8)	-	-	($3)	($8)
Biosimilars	$135	N/A	N/A	N/A	($2)	($4)	-	-	($2)	($4)

Biogen

Amounts are in millions and are GAAP and Non-GAAP. Numbers may not foot due to rounding.

Anti-CD20 Performance



Q3 2018 Highlights

Revenues vs. Q3 2017 and Q2 2018

	ΔY/Y		ΔQ/Q
U.S. Net Sales	+ 7%	and	- 3%
U.S. Profit Share[1]	+ 10%	and	- 0%
Other Anti-CD20	+ 88%	and	+ 18%
BIIB Total Anti-CD20 Revenues	+ 26%	and	+ 4%

- Other revenues from anti-CD20 therapeutic programs consist of royalty revenues on sales of OCREVUS and our share of pre-tax copromotion profits on RITUXAN in Canada.

Note: In collaboration with Roche and Genentech. Numbers may not foot due to rounding.

[1] BIIB U.S. profit share = U.S. profit share + expense reimbursement

Biogen Inc. and Subsidiaries
GAAP to Non-GAAP Reconciliation
Net Income Attributable to Biogen Inc. and Diluted Earnings Per Share
(unaudited, in millions, except per share amounts)

An itemized reconciliation between diluted earnings per share on a GAAP and Non-GAAP basis is as follows:

	For the Three Months Ended		
	September 30, 2018	September 30, 2017	June 30, 2018
GAAP earnings per share - Diluted	$ 7.15	$ 5.79	$ 4.18
Adjustments to GAAP net income attributable to Biogen Inc. (as detailed below)	0.25	0.52	1.62
Non-GAAP earnings per share - Diluted	$ 7.40	$ 6.31	$ 5.80

	For the Nine Months Ended	
	September 30, 2018	September 30, 2017
GAAP earnings per share - Diluted	$ 16.83	$ 13.30
Adjustments to GAAP net income attributable to Biogen Inc. (as detailed below)	2.39	3.25
Non-GAAP earnings per share - Diluted	$ 19.22	$ 16.55

An itemized reconciliation between net income attributable to Biogen Inc. on a GAAP and Non-GAAP basis is as follows:

	For the Three Months Ended		
	September 30, 2018	September 30, 2017	June 30, 2018
GAAP net income attributable to Biogen Inc.	$ 1,444.4	$ 1,226.1	$ 866.6
Adjustments:			
Amortization of acquired intangible assets[A, B]	281.9	108.9	107.4
Acquired in-process research and development	27.5	—	75.0
(Gain) loss on fair value remeasurement of contingent consideration[A]	(87.9)	30.0	1.9
Premium paid on purchase of Ionis common stock[C]	—	—	162.1
(Gain) loss on equity security investments	(141.2)	—	(5.4)
Net distribution to noncontrolling interests[D]	(1.5)	—	48.5
Restructuring, business transformation and other cost saving initiatives:			
2017 corporate strategy implementation[E]	3.1	—	4.0
Restructuring charges[E]	6.0	—	1.6
Income tax effect related to reconciling items	(19.3)	(27.7)	(63.7)
Tax reform[F]	(18.5)	—	3.5
Non-GAAP net income attributable to Biogen Inc.	$ 1,494.5	$ 1,337.3	$ 1,201.5

Biogen Inc. and Subsidiaries
GAAP to Non-GAAP Reconciliation
Net Income Attributable to Biogen Inc. and Diluted Earnings Per Share
(unaudited, in millions, except per share amounts)

	For the Nine Months Ended	
	September 30, 2018	September 30, 2017
GAAP net income attributable to Biogen Inc.	$ 3,483.9	$ 2,836.5
Adjustments:		
Amortization of acquired intangible assets[A, B]	493.2	674.9
Acquired in-process research and development	112.5	120.0
(Gain) loss on fair value remeasurement of contingent consideration[A]	(91.6)	61.2
Premium paid on purchase of Ionis common stock[C]	162.1	—
(Gain) loss on equity security investments	(140.2)	—
Net distribution to noncontrolling interests[D]	45.3	—
Restructuring, business transformation and other cost saving initiatives:		
2017 corporate strategy implementation[E]	10.9	—
Restructuring charges[E]	9.2	—
Hemophilia business separation costs	—	19.2
Income tax effect related to reconciling items	(96.7)	(182.5)
Tax reform[F]	(10.9)	—
Non-GAAP net income attributable to Biogen Inc.	$ 3,977.7	$ 3,529.3

Biogen Inc. and Subsidiaries
GAAP to Non-GAAP Reconciliation
Net Income Attributable to Biogen Inc. and Diluted Earnings Per Share
(unaudited, in millions, except per share amounts)

[A] Amortization of acquired intangible assets for the three and nine months ended September 30, 2018, includes the impact of impairment charges related to certain in-process research and development (IPR&D) assets associated with our vixotrigine (BIIB074) program totaling $189.3 million.

During the third quarter of 2018 we completed a Phase 2b study for vixotrigine in painful lumbosacral radiculopathy (PLSR). The study did not meet its primary or secondary efficacy endpoints and we will discontinue development in PLSR. As a result, we recognized an impairment charge of approximately $60.0 million during the third quarter of 2018 to reduce the fair value of the IPR&D intangible asset to zero.

In addition, we have delayed the initiation of the Phase 3 studies of vixotrigine in trigeminal neuralgia (TGN) as we await the outcome of ongoing interactions with the U.S. Food and Drug Administration regarding the design of the Phase 3 studies, a more detailed review of the data from the Phase 2b study of vixotrigine in PLSR, and insights from the Phase 2 study of vixotrigine in small fiber neuropathy. We have reassessed the fair value of the TGN program using reduced expected lifetime revenues, higher expected clinical development costs, and a lower cumulative probability of success. As a result, we recognized an impairment charge of $129.3 million during the third quarter of 2018 to reduce the fair value of the TGN IPR&D intangible asset to $41.8 million. We also adjusted the value of our contingent consideration obligations related to this program to reflect the lower cumulative probabilities of success resulting in a gain of $89.6 million in the third quarter of 2018.

We may recognize additional impairment charges in the future depending upon our ability to advance vixotrigine for the treatment of TGN or other indications.

[B] Amortization of acquired intangible assets impairment and amortization charges related to the intangible asset associated with our U.S. and rest of world licenses to Forward Pharma A/S' (Forward Pharma) intellectual property, including Forward Pharma's intellectual property related to TECFIDERA. In exchange for these licenses, we paid Forward Pharma $1.25 billion in cash, of which $795.2 million was recognized as an intangible asset in the first quarter of 2017.

We have two intellectual property disputes with Forward Pharma, one in the U.S. and one in the European Union, concerning intellectual property related to TECFIDERA. In March 2017 the U.S. intellectual property dispute was decided in our favor. We evaluated the recoverability of the U.S. asset acquired from Forward Pharma and recorded a $328.2 million impairment charge in the first quarter of 2017 to adjust the carrying value of the acquired U.S. asset to fair value reflecting the impact of the developments in the U.S. legal dispute. In March 2018 the European Patent Office revoked Forward Pharma's European Patent No. 2 801 355. Based upon our assessment of these rulings, we continue to amortize the remaining net book value of the U.S. and rest of world intangible assets in our condensed consolidated statements of income utilizing an economic consumption model.

[C] In June 2018 we closed a new ten-year exclusive agreement with Ionis Pharmaceuticals, Inc. (Ionis) to develop novel antisense oligonucleotide drug candidates for a broad range of neurological diseases for a total payment of $1.0 billion consisting of an upfront payment of $375.0 million and the purchase of approximately 11.5 million shares of Ionis' common stock at a cost of $625.0 million.

The 11.5 million shares of Ionis' common stock were purchased at a premium to their fair value at the transaction closing date. The premium consisted of acquiring the shares at a price above the fair value based on the trailing 10-day weighted-average close price prior to entering into the agreement in April 2018 and the effect of certain holding period restrictions. We recorded an asset of $462.9 million in investments and other assets in our condensed consolidated balance sheets reflecting the fair value of the common stock and a charge of $162.1 million to research and development expense in our condensed consolidated statements of income during the second quarter of 2018, reflecting the premium paid for the common stock.

[D] Net distribution to noncontrolling interests reflects the $50.0 million payment to Neurimmune SubOne AG (Neurimmune), net of Neurimmune's tax, to further reduce the previously negotiated royalty rates payable on products developed under our amended collaboration and license agreement, including on potential commercial sales of aducanumab, by an additional 5%.

[E] 2017 corporate strategy and restructuring charges are related to our efforts to create a leaner and simpler operating model.

[F] The Tax Cuts and Jobs Act of 2017 (2017 Tax Act), which was signed into law in December 2017, has resulted in significant changes to the U.S. corporate income tax system. During the fourth quarter of 2017 we recognized within our provision for income taxes a $1.2 billion provisional estimate under the U.S. Securities and Exchange Commission Staff Accounting Bulletin No. 118. Our provisional estimate included an amount resulting from a one-time mandatory deemed repatriation tax on accumulated foreign subsidiaries' previously untaxed foreign earnings (the Transition Toll Tax) and amounts related to the impact of remeasuring our deferred tax balances to reflect other aspects of the 2017 Tax Act.

The final determination of the Transition Toll Tax and remeasurement of our deferred assets and liabilities will be completed as additional information becomes available, but no later than one year from the enactment of the 2017 Tax Act. Our preliminary estimate of the Transition Toll Tax and the remeasurement of our deferred tax assets and liabilities is subject to the finalization of management's analysis related to certain matters, such as developing interpretations of the provisions of the 2017 Tax Act and changes to certain estimates and amounts related to the earnings and profits of certain subsidiaries.

During the three months ended September 30, 2018, we recognized a net reduction of $34.6 million in our estimated Transition Toll Tax, an expense of $5.1 million to remeasure our deferred tax balances and an $11.0 million expense to reflect other aspects of the 2017 Tax Act. During the nine months ended September 30, 2018, the remeasurement of our deferred tax balances resulted in an expense totaling $12.7 million.

Biogen

Use of Non-GAAP Financial Measures

We supplement our consolidated financial statements presented on a GAAP basis by providing additional measures which may be considered "Non-GAAP" financial measures under applicable SEC rules. We believe that the disclosure of these Non-GAAP financial measures provides additional insight into the ongoing economics of our business and reflects how we manage our business internally, set operational goals and form the basis of our management incentive programs. These Non-GAAP financial measures are not in accordance with generally accepted accounting principles in the United States and should not be viewed in isolation or as a substitute for reported, or GAAP, net income attributable to Biogen Inc. and diluted earnings per share.

Our "Non-GAAP net income attributable to Biogen Inc." and "Non-GAAP earnings per share - Diluted" financial measures exclude the following items from "GAAP net income attributable to Biogen Inc." and "GAAP earnings per share - Diluted":

1. Purchase accounting, merger-related and other adjustments

We exclude certain purchase accounting related items associated with the acquisition of businesses, assets and amounts in relation to the consolidation or deconsolidation of variable interest entities for which we are the primary beneficiary. These adjustments include, but are not limited to, charges for in-process research and development and certain milestones, the amortization of intangible assets, and charges or credits from the fair value remeasurement of our contingent consideration obligations.

2. Hemophilia business separation costs

We have excluded costs that are directly associated with the set up and spin-off of our hemophilia business into an independent, publicly-traded company on February 1, 2017. These costs represent incremental third party costs attributable solely to hemophilia separation and set up activities.

3. Restructuring, business transformation and other cost saving initiatives

We exclude costs associated with the company's execution of certain strategies and initiatives to streamline operations, achieve targeted cost reductions, rationalize manufacturing facilities or refocus R&D activities. These costs may include employee separation costs, retention bonuses, facility closing and exit costs, asset impairment charges or additional depreciation when the expected useful life of certain assets have been shortened due to changes in anticipated usage and other costs or credits that management believes do not have a direct correlation to our on-going or future business operations.

4. Loss (gain) on equity security investments

Effective January 2018 we exclude unrealized and realized gains and losses and discounts or premiums on our equity security investments as we do not believe that these components of income or expense have a direct correlation to our on-going or future business operations.

5. Other items

We evaluate other items of income and expense on an individual basis, and consider both the quantitative and qualitative aspects of the item, including (i) its size and nature, (ii) whether or not it relates to our ongoing business operations, and (iii) whether or not we expect it to occur as part of our normal business on a regular basis. We also include an adjustment to reflect the related tax effect of all reconciling items within our reconciliation of our GAAP to Non-GAAP net income attributable to Biogen Inc. and diluted earnings per share.