Looking Back and Managing Ahead

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Celia and Isaac Haidak Professor
Dean, Provost and Executive Deputy Chancellor
&
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Executive Vice Chancellor for Administration and Finance

October 18, 2018

University of Massachusetts Medical School
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Progress Since Last Strategic Plan

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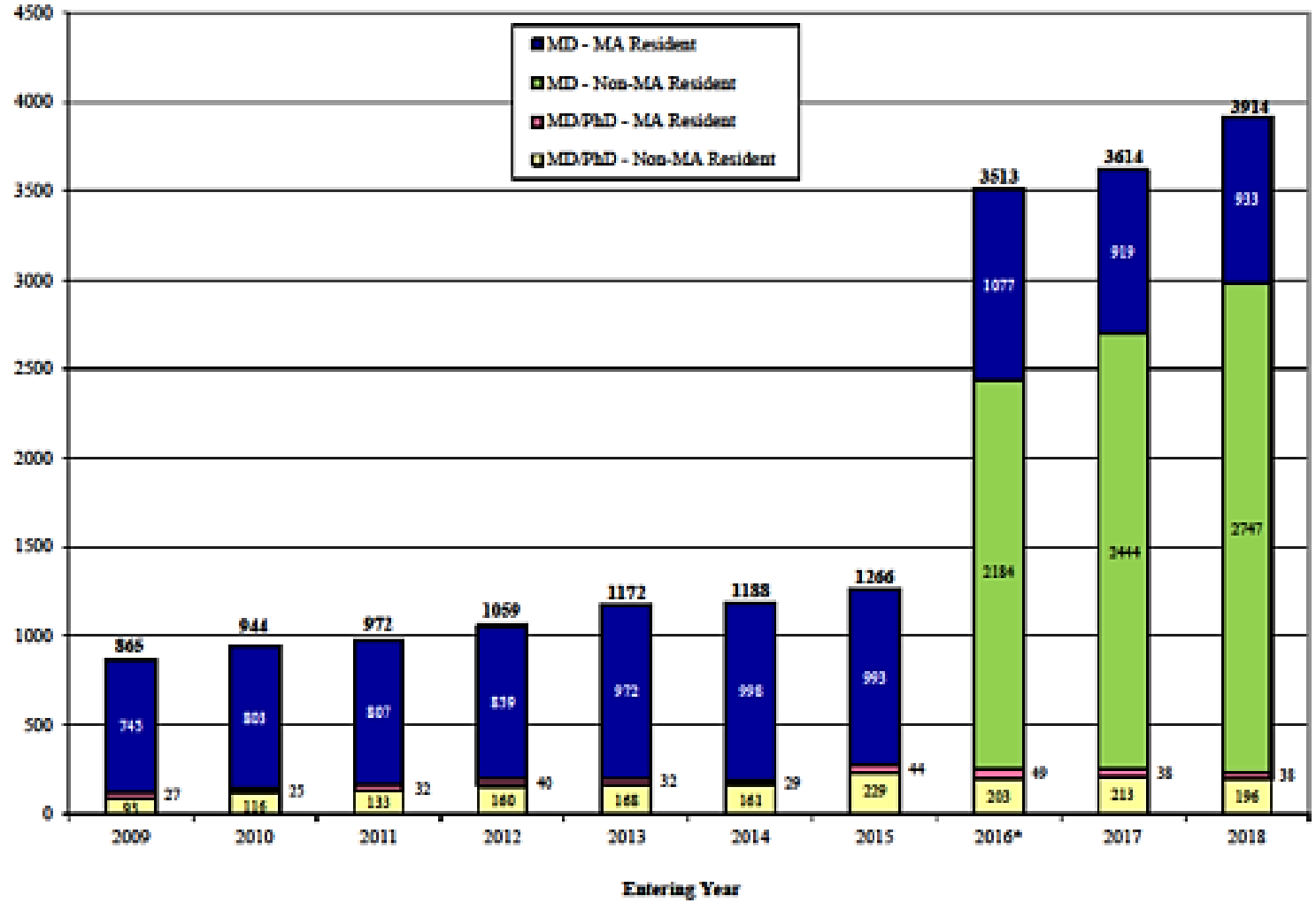
Education - Major Milestones Achieved To-Date

Background Information

As an innovative, interprofessional community of students and educators, we will build a health care delivery and biomedical research workforce that makes a lasting impact on human and community health.

EDUCATION	
Objectives	
• Inter-professional Education	• Established the Liaison Committee for Interprofessional Curriculum (LCIC) to serve as the vehicle from which to implement interprofessional educational goals across the four schools (SOM, GSN, GSBS, GME) • Established the pioneering Opioid Safe-prescribing Training Immersion (OSTI) Program to ensure all graduating medical and nurse practitioner students, as well as medical residents, are trained to be safe prescribers.
• New Teaching Affiliations	• New clinical teaching affiliations with Cape Cod Health and Baystate Health and opened the first regional campus of UMMS at Baystate Health. • Designed and formally launched the new Population-based Urban and Rural Community Health or PURCH Track, which is offered at the UMMS-Baystate Campus; Welcomed the inaugural cohort of 22 PURCH students in the fall of 2017; appointed a new regional executive dean of UMMS-Baystate; successfully revised the UMMS Governance Document to formally establish 10 UMMS-Baystate clinical departments; Launched a process to provide UMMS-Baystate faculty appointments to more than 700 clinical educators at UMMS-Baystate.
• Class size expansion	• Increased class size from 125 to 162 (30% increase).

Applications Received at UMMS
(Total number of verified applications)



*Beginning in 2016, Non-MA residents were allowed to apply to MD program.
Graph by IREA, 10/10/18.

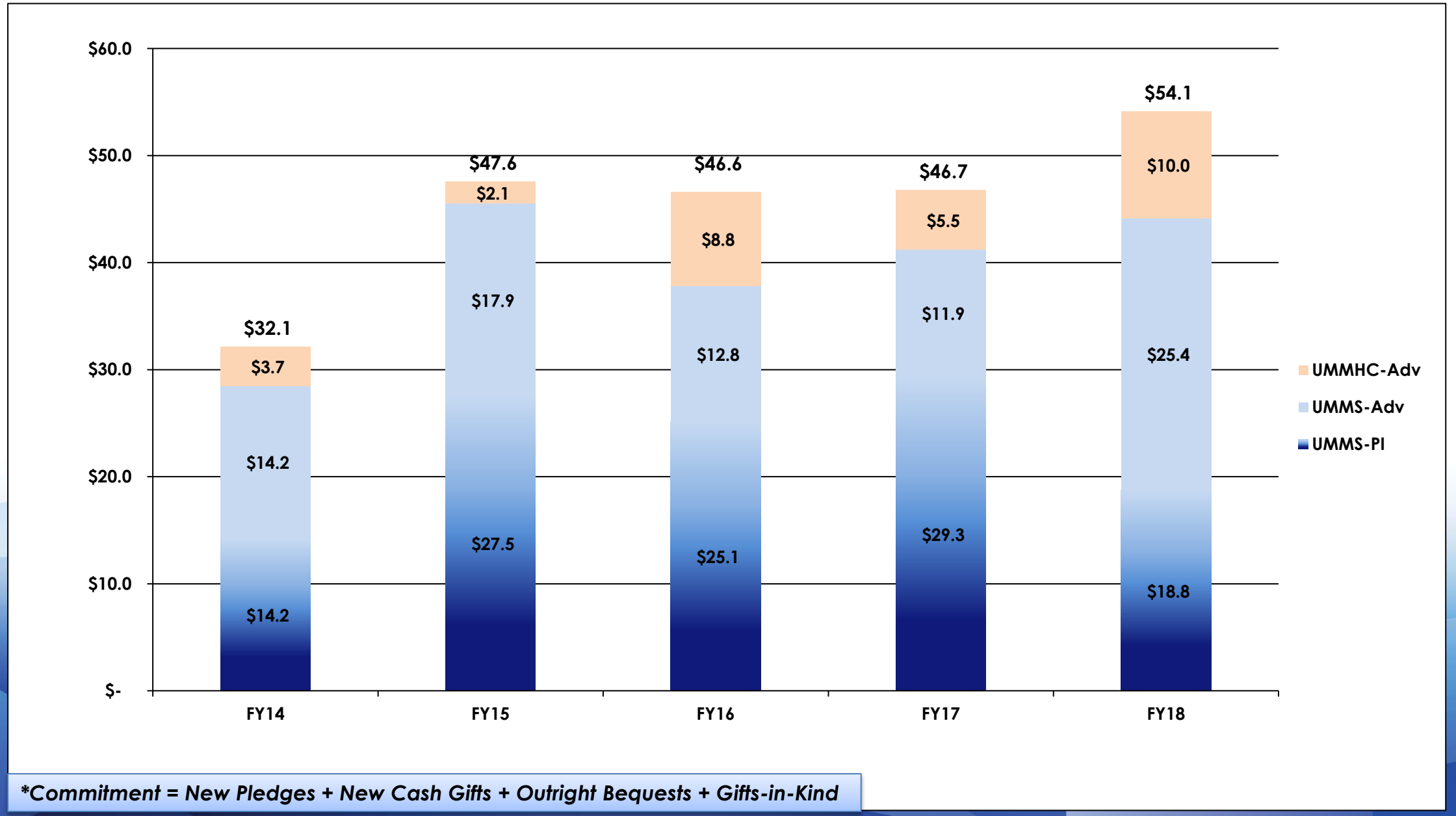
Basic Science - Major Milestones Achieved To-Date

Background Information

In 2013, a Basic Science Work Group (convened in support of Vision 2020) identified a number of proposals/goals which are summarized on this and the next several pages along with major milestones achieved to-date.

Improve financial resources dramatically and invest the resulting funds creatively	
A. Financial Resources	
• Increase Development	• Annual Fund Raising has increased from approximately $32M per year and in FY18 exceeded $54M. $10M endowment for Institute Rare Disease Research, $2M for GTC, approximately 3 new endowed chairs each year, three from donors from the Middle East who had no prior UMMS contact.
• Clinical System Research Investment	• UMMHC invested $700M over ten years upgrading EPIC, and at the same time agreed to cover half the costs of two critical research informatics interfaces: the Data Lake (a clinical data repository with all EPIC data in it) and Oncore (the Clinical Trials Management system). These two investments were key to our successful CTSA renewal.
• Industry and other collaboration	• Created Office of EVC-IBD. • Industry-funded research more than doubled from $9.3M (FY13) to $20.6M (FY18) • We have begun reporting PPGs in the Annual Awards reports (from the Office of Sponsored Programs). The awards grew to $7.9M for AY18, including grants in the Gene Therapy Center, BMP, BIB, MaPS, PMM and RTI.
• Promote entrepreneurship	• The office of the EVC-IBD has been created and major Newcos with series A funding in hand (at least $30M each) have been spun off with major Venture Partners: 2rd Rock did 2 (Voyager and Fulcrum), Morningside (Chan) has done 2 (Bacainn and Apic Bio), Atlas has done 1 (Generation Bio), Bridge Bio has done 1 (Newco on Canavan), Glory Harvest Group (Li) has done 4 (cancer gene therapy, tethered miRNA, adipose-derived stem cells, DNA vaccine for HIV). With Atalanta (siRNA) about to be launched. • MILESTONE FDA clinical approvals of UMMS technology-based products: patisiran (TTR-amyloidosis from Alnylam), spinraza (SMA from Ionis/Biogen), rabishield (Rabies MSb from SII/MBL), zinplava (C.Diff from Merck). Total $100M captured in FY18.
• Start new companies in our biotech park, in part by establishing Worcester based angel funding	• The Glory Harvest Group companies will be in Biotech 3 of UMMS purchased Biotech Park.
• Maintain the sacrosanct status of the RTF system	• Done
• Enlarge “bridge” fund to at least $10M, and jettison its loan format	• Will be launched in the 2nd half of FY19 ($1M)

UMMF New Commitments* - 5 Year View ($millions)



*Commitment = New Pledges + New Cash Gifts + Outright Bequests + Gifts-in-Kind

Basic Science - Major Milestones Achieved To-Date

Background Information

Improve financial resources dramatically and invest the resulting funds creatively	
B. Infrastructure Investment	
• Remodel the core system	• Reinstated RAC, put core subcommittees under the RAC. Add $500k per year extra to Cores for investment.
• Utilize the Biotech Park buildings for incubator space, novel training opportunities, and a centralized core cluster ("innovation center")	• Started M2D2-Worcester serving both Biotech and Device development on the 6th floor basic wing. First three tenants are Biotech Companies.
• Investment in high performance computing infrastructure	• Hired Jomol Mathew and have continued to expand resources internally, with the UMass system GHPCC and with Amazon and other contract resources.
• Expand and renew existing basic science departments to ensure vitality: replace faculty lost to retirement, lack of tenure, or transfer (inside or outside the institution)	• Have maintained pace of 6 to 7 Faculty hires per year.
• Consider the pros and cons of departmental consolidations	• Completed CDB, BNRI and Division of Preventive and Behavioral Medicine Merger.

Basic Science - Major Milestones Achieved To-Date

Background Information

Other	
Build a Bona Fide Cancer Center	
• Working with the Clinical System, revamp basic and clinical efforts to create a cancer center	• Joint hire of Jonathan Gerber as adult Hematology-Oncology Division Chief, with Endowed Chair, three tenure lines and support for biorepository of bone marrow and AML samples. • Joint hire of Jason Shohet, Pediatric Hematology-Oncology Division Chief, with Endowed Chair.
• Utilize the revamped cancer center to build infrastructure for key basic science areas, including bioinformatics and human genetics	• With Jomol Mathew's help have brought the entire tumor repository of UMMHC Pathology into the cancer tissue bank.
Address Other Areas of Cross-Disciplinary Strategic Interest	
• Ensure that other areas of cross-disciplinary strategic interest are addressed, including stem cell biology, drug resistance, and the microbiome	• Leveraged major investments from UMMS, MLSC, and HHMI to create cryoEM and use a focus for Structure-based Drug Resistance efforts.
Revise Graduate Student and Postdoctoral Fellow Training to make it more flexible and to make our students much more capable of succeeding at diverse opportunities when they leave UMMS	
• Enhance coursework, and student and faculty recruitment, in bioinformatics and chemistry	• Revolutionized curriculum with Foundations core course.
• Provide opportunities for training in non-academic careers (GSBS-, NIH- and Burroughs Welcome Fund- sponsored initiative in place through summer 2018)	• Found mechanisms to continue efforts of Cynthia Fuhrmann in GSBS.
• Provide enhanced training and mentorship for postdoctoral fellows	• Continued support to Tony Imbalzano as Associate Dean for Post-doctoral studies.
• Encourage broad opportunities for interdisciplinary interactions by students, postdocs, and faculty, including those from other UMass campuses	• Plan finalized to launch PhD/MBA with UMass Lowell, recruiting Fall 2018, enrolling Summer 2019.
• Promote research-oriented interactions between the basic and clinical systems	• Continued robust investment and strategic alignment with CCTS and Office of Innovation and Business Development to ensure clinical translation.

Translational Research and IT - Major Milestones Achieved To-Date

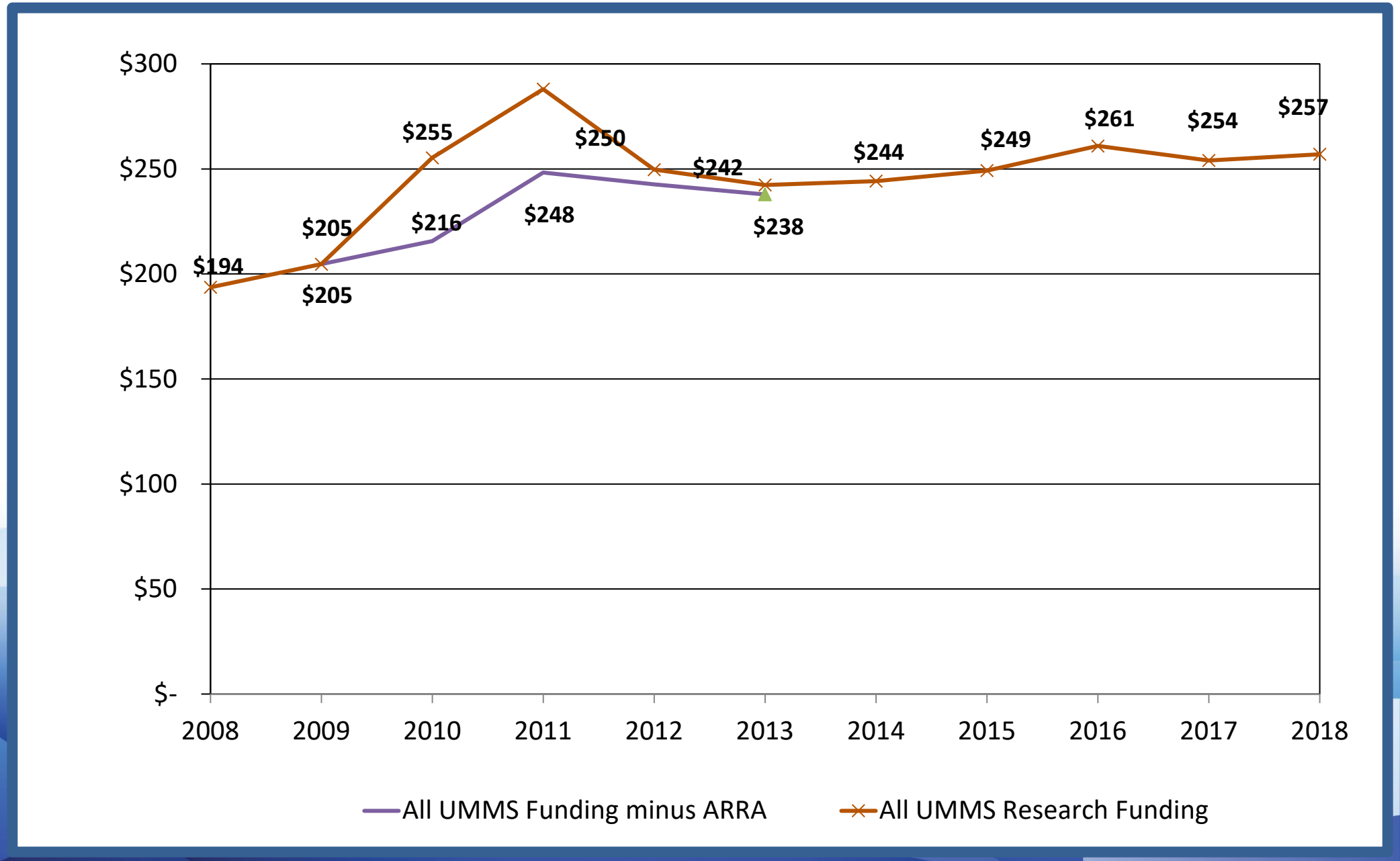
Background Information

We will create a transformative research ecosystem that enables rapid development of products for clinical use, collaborates with the clinical system as a laboratory for clinical and translational research, and partners with the community to drive improvements in individual and population health.

We will establish an information technology environment that enables the best care and patient experience, educates the finest caregivers and scientists and accelerates future therapies.

Translational Research	
• CTSA Renewal	• In August 2015, UMMS received a 4-year, $17.3 million CTSA grant renewal. • In 2016, MassBiologics was selected by the National Center for the Advancement of Translational Sciences (NCATS) to become a preferred, prequalified provider for contract process development and manufacturing of monoclonal antibodies and viral vectors. Investigators in the Department of Quantitative Health Sciences have received a new $5,042,311 NCATS U01 grant as an adjunct to the CTSA, "Strengthening Translational Research in Diverse Enrollment (STRIDE)".
• Therapeutic Development	• MILESTONE FDA clinical approvals of UMMS technology-based products: patisiran (TTR-amyloidosis from Alnylam), spinraza (SMA from Ionis/Biogen), rabishield (Rabies MSb from SII/MBL), zinplava (C.Diff from Merck). • Two therapeutics discovered at MassBiologics received FDA approval in FY2017: Merck's Zinplava to treat recucrrent c. difficile infection; and Serum Institute of India's Rabishield, a first-in-the-world monoclonal antibody for post-exposure prophylaxis of Rabies.
• Restructuring Cancer Research	• See Basic Science Section
Information Technology	
• IT Leadership Engagement	• Medical School CIO part of 24 person task force chosen by UMMHC CEO to select a new Electronic Medical Record System. • IT Councils for both UMMS and UMass Memorial Medical Center coordinate strategic activities across both entities, including support for a long term electronic health record initiative. Developed 'date' lake strategy for clinical research database with UMass Memorial in anticipation of new electronic health record.
• Integration of Data	• EPIC • Data Lake • ONCORE

Research Funding: Fiscal Years 2008 - 2018

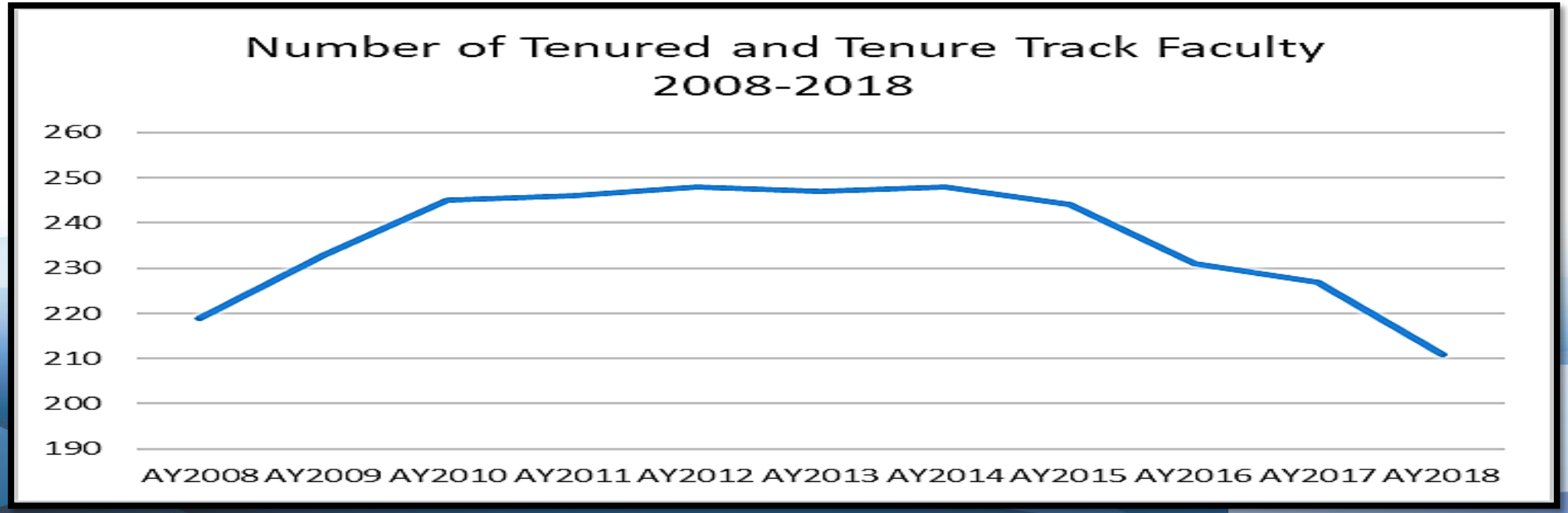


Blue Ridge Institute for Medical Research (BRIMR)
2017 Ranking Tables of NIH Funding to US Medical Schools

UMMS Department (BRIMR Dept)		Total costs	Rank
MCCB & PMM (Anatomy/Cell Biology)		$ 38,596,513	1
Emergency Medicine (Emergency Medicine)		$ 2,144,589	5
BMP (Biochemistry)		$ 12,435,629	14
GTC & RTI (Genetics)		$ 13,465,983	14
Orthopedics (Orthopedics)		$ 728,938	23
QHS (Public Health)		$ 2,418,998	26
Neurobiology (Neurosciences)		$ 5,469,864	27
Pathology (Pathology)		$ 6,753,752	30
Neurology (Neurology)		$ 6,580,903	32
Radiology (Radiology)		$ 2,682,240	35
Medicine (Internal Medicine)		$ 33,507,271	36
Family Medicine (Family Medicine)		$ 25,511	41
Psychiatry (Psychiatry)		$ 4,737,827	43
MAPS (Microbiology)		$ 6,214,376	43
Pediatrics (Pediatrics)		$ 3,197,740	49
Surgery (Surgery)		$ 418,750	65
Ophthalmology (Ophthalmology)		No UMMS data	No UMMS data
Anesthesiology (Anesthesiology)		No UMMS data	No UMMS data
Dermatology (Dermatology)		No UMMS data	No UMMS data
Neurosurgery		No UMMS data	No UMMS data
OBGYN (OBGYN)		No UMMS data	No UMMS data
Otolaryngology (Otolaryngology)		No UMMS data	No UMMS data
Urology (Urology)		No UMMS data	No UMMS data
		$ 139,378,884	
UMMS Ranked 32 out of 139		$ 153,024,069	

Tenure/Tenure Track Faculty Trends

Year	Beginning # TTR/TEN	New Hires	Transfers to TTR	Transfers to NTT/Term	Ending # TTR/TEN
AY2008	211	10	7	9	219
AY2009	219	18	2	6	233
AY2010	233	18	0	6	245
AY2011	245	9	3	11	246
AY2012	246	8	9	15	248
AY2013	248	13	2	16	247
AY2014	247	7	1	7	248
AY2015	248	8	0	12	244
AY2016	244	5	4	22	231
AY2017	231	8	1	13	227
AY2018	227	5	1	22	211
AY2019 YTD	211	1	0	1	



Tenure/Tenure Track Faculty Commitments

Unfilled Committed Slots April 2017	New Committed Slots September 2018	Revised Unfilled Slots September 2018	Filled T/ Slots September 2018	Total T/TT Slots Filled/ Committed
40	11.5	51.5	211	262.5

Planned Faculty Recruitment

FY	Examples of Departments Recruiting
FY19 (8)	BIB, Medicine-Hemonc, Medicine-Hepatology, MCCB, QHS, Pathology, GTC, RTI
FY20 (8)	Neurobiology, Medicine-Hepatology, Medicine-HemOnc, Medicine-ID, PSB, MaPS, GTC, RTI
FY21 (7)	Dermatology, Pediatrics, HemOnc, Diabetes, MCCB, QHS, Pathology, PSB

Research Density of School Buildings for F&A Purposes

(FY17 Space Survey Data)

Building	Building Name	Research SF	Usable SF*	Research Density	Max Potential Research Density**	% of Efficiency	Vacant lab space	Vacant Office Space	Vacant space
001	MEDICAL SCHOOL	63,365	394,861	16.05%	41.00%	39.14%	25,833	11,756	37,590
005	SHAW	2,907	21,099	13.78%	30.00%	45.93%	116	5,170	5,286
010	LAZARE RESEARCH(LRB)	148,354	222,355	66.72%	75.00%	88.96%	16,044	2,751	18,794
013	AMB CARE CENTER(ACC-7th)	1,378	13,484	10.22%	75.00%	13.63%	-	-	-
014	BIOTECH ONE(1st flr)	2,279	8,165	27.91%	75.00%	37.21%	201	1,975	2,176
015	BIOTECH TWO	44,367	60,256	73.63%	75.00%	98.17%	2,931	56	2,987
108	ALBERT SHERMAN CENTER(ASC)	119,121	270,949	43.96%	51.00%	86.20%	10,184	5,920	16,104
Grand Total		**381,771**	**991,169**				**55,309**	**27,628**	**82,937**

*Usable SF excludes vacant, common, circulation and O&M areas

**Based on intended use of all space regardless of current occupancy and assuming 25% for other activities aside from research (education, clinical, public service)

Looking Back and Managing Ahead

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UMMS Financial Results (FY 2013-2018)

($ in thousands)	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating revenues						
State appropriations	$ 41,136	$ 44,620	$ 45,843	$ 50,634	$ 52,250	$ 54,559
Independent Business Lines (non-grant activity)	367,576	355,527	323,577	337,259	379,715	305,391
Grants and Contracts	192,863	189,355	193,704	192,354	201,638	196,444
Clinical System	50,357	53,276	52,623	58,040	56,746	54,416
Net Tuition and fees	14,367	16,245	16,867	18,612	21,455	25,289
Other revenues	252,559	257,126	146,668	320,368	260,999	334,404
Total operating revenues	**918,858**	**916,149**	**779,282**	**977,267**	**972,803**	**970,503**
Operating expenses						
Academic Operations	377,298	423,857	305,883	492,265	396,941	486,741
Independent Business Lines (non-grant activity)	354,473	337,473	305,560	307,280	343,596	266,806
Grants	188,738	188,049	200,453	188,321	201,594	196,023
Total operating expenses	**920,509**	**949,379**	**811,896**	**987,866**	**942,131**	**949,570**
Operating Margin						
	(1,651)	**(33,230)**	**(32,614)**	**(10,599)**	**30,672**	**20,933**
	-0.2%	**-3.6%**	**-4.2%**	**-1.1%**	**3.2%**	**2.2%**
Non-operating Revenue and Expenses						
Net Non-operating revenue and expenses	34,551	28,772	19,536	(5,943)	27,645	(8,700)
Total Increase in Net Position	**$ 32,900**	**$ (4,458)**	**$ (13,078)**	**$ (16,542)**	**$ 58,317**	**$ 12,233**

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Comparative Statement of Net Position

($ in thousands)	2013	2018	Change	
Assets				
Cash & Investments				
Quasi-endowment	$ 102,794	$ 110,476	$ 7,682	7.5%
Other Cash and Investments	135,284	278,266	142,982	105.7%
Cash Held by Trustee	30,389	127	(30,262)	-99.6%
Receivables	134,589	134,248	(341)	-0.3%
Inventories	13,015	13,365	350	2.7%
Orgs	27,628	44,253	16,625	60.2%
Property, Plant & Equipment	1,079,000	954,168	(124,832)	-11.6%
Other Assets	3,995	5,482	1,487	37.2%
Total Assets	1,526,694	1,540,385	13,691	0.9%
Liabilities				
Accounts & Wages Payable	77,993	64,920	(13,073)	-16.8%
Debt	720,309	625,673	(94,636)	-13.1%
Due to Related Organizations	4,744	4,564	(180)	-3.8%
Other Liabilities	51,434	136,894	85,460	166.2%
Total Liabilities	854,480	832,051	(22,429)	-2.6%
Net Assets				
Invested in Plant	385,239	330,954	(54,285)	-14.1%
Restricted	43,745	74,459	30,714	70.2%
Unrestricted	243,230	302,921	59,691	24.5%
Total Net Assets	**672,214**	**708,334**	**36,120**	**5.4%**
Total Liabilities & Net Assets	**$ 1,526,694**	**$ 1,540,385**	**$ 13,691**	**0.9%**
Endowment Balance (on UMass Foundation Books)	**$ 68,643**	**$ 108,314**	**39,671**	**57.8%**

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Comparative Statement of Net Position, continued (FY2013-2018)

Total Assets have increased from $1.527 B to $1.540B (a $13.7M or 1% increase).

- The increase in cash and investments is offset by a decrease in property, plant and equipment due to increased depreciation expense related to capital improvements.

Total Liabilities have decreased from $854M to $832M (a $22M or 3% decrease).

- Driven primarily by a decrease in debt from $720M to $625M (a $95M or 13% decrease).

Total Net Assets have grown from $672M to $708M (a $36M or 5% increase).

Endowments have grown from $69M to $108M (a $40M or 58% increase).

UMMS 5-Year Financial Plan (FY 2019-2023)

($ in thousands)	FY2018 Actual	FY2019	FY2020	FY2021	FY2022	FY2023
Operating revenues						
State appropriations	$ 54,559	$ 52,744	$ 53,882	$ 55,027	$ 56,203	$ 57,380
Independent Business Lines (non-grant activity)	305,391	367,504	384,387	402,086	420,638	449,077
Grants and Contracts	196,444	211,561	219,791	229,830	240,211	252,593
Clinical System	54,416	57,646	59,936	62,508	60,744	62,262
Net Tuition and fees	25,289	27,474	30,044	31,748	32,660	33,645
Other revenues	334,404	231,393	236,591	240,272	244,971	237,892
Total operating revenues	**970,503**	**948,322**	**984,631**	**1,021,471**	**1,055,427**	**1,092,849**
Operating expenses						
Academic Operations	486,741	399,664	405,213	409,778	413,864	420,492
Independent Business Lines (non-grant activity)	266,806	332,380	347,606	363,565	380,289	397,846
Grants	196,023	211,561	219,791	229,830	240,211	252,593
Total operating expenses	**949,570**	**943,605**	**972,610**	**1,003,173**	**1,034,364**	**1,070,931**
Operating Margin						
As presented to BoT Nov 2017	**20,933**	**4,717**	**12,021**	**18,298**	**21,063**	**21,918**
	2.2%	**0.5%**	**1.2%**	**1.8%**	**2.0%**	**2.0%**
Current Target		**17,903**	**19,693**	**20,429**	**21,109**	**21,857**
		2.0%	**2.0%**	**2.0%**	**2.0%**	**2.0%**
Gap		**13,186**	**7,672**	**2,131**	**46**	**(61)**
Non-operating Revenue and Expenses						
Net Non-operating revenue and expenses	(8,700)	4,067	4,968	5,229	6,427	6,817
Total Increase in Net Position	**12,233**	**8,784**	**16,989**	**23,527**	**27,490**	**28,735**

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5-Year Financial Plan: Assumptions (FY2019-2023)

State Appropriation

- FY'18 = Flat
- FY'19 – '22 = Growth based on CBA

Grants & Contracts

- FY'18 = 7.5% over FY'17 budget (based on current research awards data), flat with FY'17 actual
- FY'19 – '22 = 4%
- Reduced Federal funding would have offsetting impact on revenue and expense

SOM Class Size

- FY'18 = class size of 162
- FY'19 = Completion of 3-year plan to increase tuition
- FY'21 = All classes at 162
- Aggregate new revenue impact of $14 M annually

Financial Aid

- Grows with total tuition charges

Annual gift revenue

- $6 to $7 M per year
- Does not include endowment receipts
- Total Achievement remains consistent with annual goals agreed to with the President's Office

5-Year Financial Plan: Assumptions (Continued FY2019-2023)

UMMHC Participation Payment:

- FY'18 – '20 – No Payment
- FY'21 = $2.1 M
- FY'22 = $3.2 M

Salary increases at 2% per year.

Fringe benefits and pension rates remain flat.

Faculty Recruitment:

- Maintain current spending level of $10-11 M per year
- Recruitments remain at 6-8 per year

Campus Capital Expenditures:

- New project capital commitments of approximately $20 M annually
- Deferred maintenance spending; a local investment of $20 M per year from FY'18 – '20
- NO STATE CAPITAL FUNDING ASSUMED

Key Financial Success Factors (FY2019-2023)

Main Campus:

- Increased class size, including acceptance of out-of-state students
- UMMS and Baystate Health have partnered to establish the Medical School's first-ever regional campus, *UMMS-Baystate,* in Springfield
- Basic and translational research growth
- Investment in licensing activities; potential for IP / licensing revenue to grow by an additional $20 - $30 million annually
- Continued philanthropic efforts

Commonwealth Medicine:

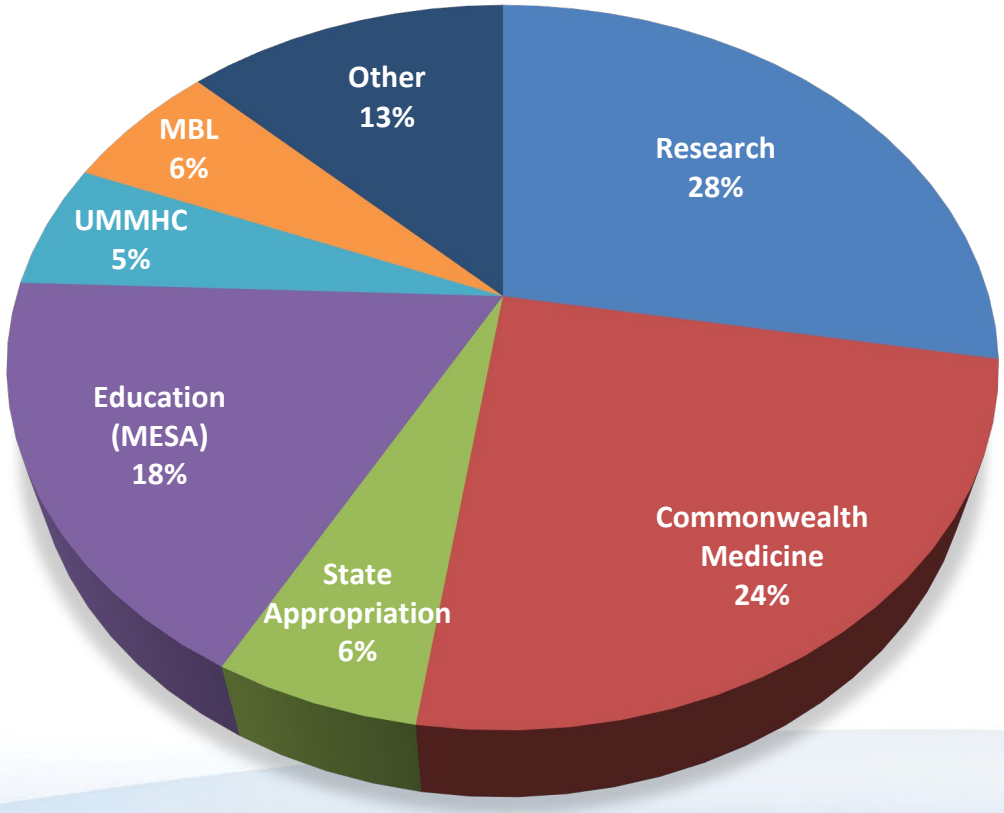
- Support & grow Center for Health Care Financing
- Expand business lines to other states
- Continually evaluate low margin businesses
- Leadership succession
- Grow margin by a minimum of 3% annually

MassBiologics:

- Maintain or increase Td sales
- Continue to develop and grow contract manufacturing
  - Add a further processing line
- Manage royalty stream
  - Current IP portfolio
  - Develop new licenses

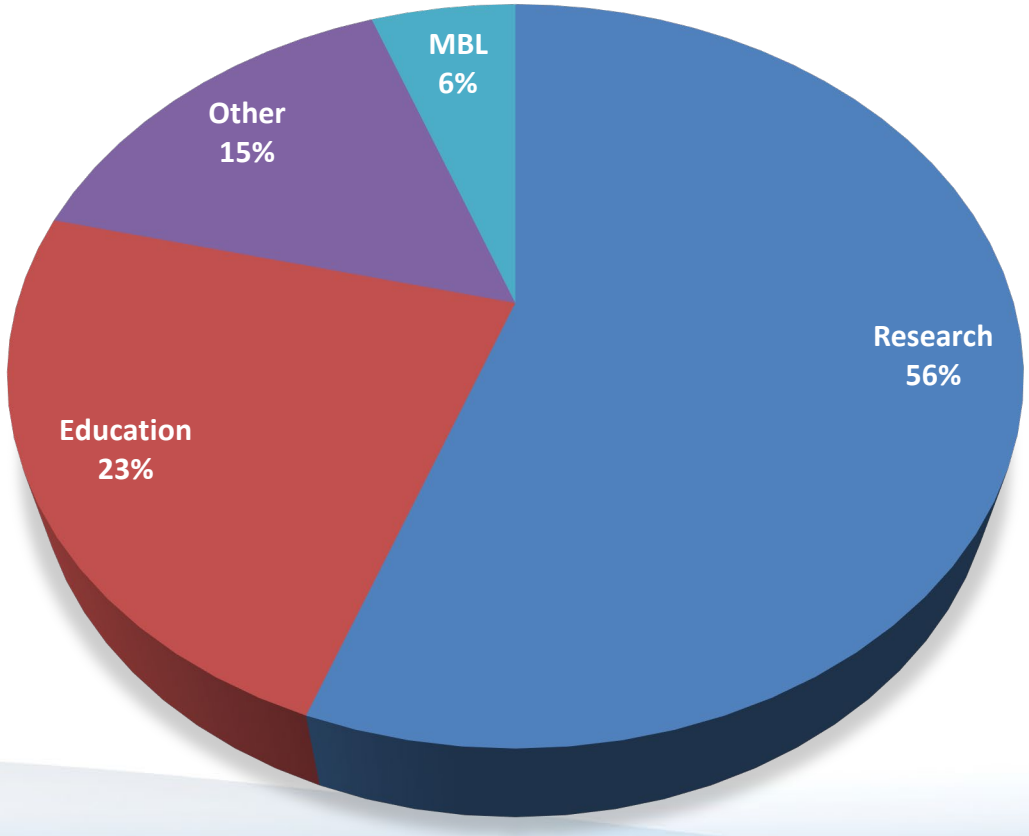
FY2018 Mission-Based Funding Model

Revenue Sources



FY18 Total Revenue: $970M

Annual Investments in the Mission



Total Investment in the Mission: $200M

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