Radius Health, Inc.
Form S-1/A
October 19, 2012

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As filed with the Securities and Exchange Commission on October 19, 2012

Registration No. 333-179397

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

AMENDMENT NO. 2
to
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Radius Health, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**2834**	**80-0145732**
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

201 Broadway, 6th Floor
Cambridge, Massachusetts 02139
(617) 551-4700
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Michael S. Wyzga
Chief Executive Officer
Radius Health, Inc.
201 Broadway, 6th Floor
Cambridge, Massachusetts 02139
(617) 551-4700
(Name, address, including zip code, and telephone number, including area code, of agent for service)

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Approximate date of commencement of proposed sale to the public:
As soon as practicable after this Registration Statement becomes effective.

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. o

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definitions of "large accelerated filer," "accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer o	Accelerated filer o	Non-accelerated filer o (Do not check if a smaller reporting company)	Smaller reporting company ý

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

PRELIMINARY PROSPECTUS Subject to Completion October 19, 2012

Prospectus

6,500,000 Shares

Common Stock

Radius Health, Inc. is offering 6,500,000 shares of its common stock. See "The offering." Prior to this offering, there has been no public market for our common stock. We currently expect the public offering price of our common stock to be between $8.50 and $10.50 per share.

After the pricing of this offering, we expect that our common stock will be listed on the NASDAQ Global Market under the symbol "RDUS."

Investing in our common stock involves a high degree of risk. Before buying any shares of our common stock, you should carefully read the discussion of material risks of investing in our common stock in "Risk factors" beginning on page 10 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission nor any other regulatory body has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

	Per share	Total
Public offering price	$	$
Underwriting discounts and commissions	$	$
Proceeds, before expenses, to us	$	$

The underwriters may also purchase up to an additional 975,000 shares of our common stock at the public offering price, less the underwriting discounts and commissions payable by us, to cover over-allotments, if any, within 30 days from the date of this prospectus. If the underwriters exercise this option in full, the total underwriting discounts and commissions will be $ million and our total proceeds, before expenses and underwriting discounts and commissions will be $ million.

Certain of our existing stockholders and their affiliated entities have indicated an interest in purchasing an aggregate of up to approximately $14 million in shares of our common stock in this offering at the initial public offering price. However, because indications of interest are not binding agreements or commitments to purchase, these stockholders may determine to purchase fewer shares than they indicate an interest in purchasing or not to purchase any shares in this offering. In addition, the underwriters could determine to sell fewer shares to these stockholders than the stockholders indicate an interest in purchasing or not to sell any shares to these stockholders.

The underwriters are offering the common stock as set forth under "Underwriting." Delivery of the shares will be made on or about , 2012.

UBS Investment Bank **Leerink Swann**

Cowen and Company **Lazard Capital Markets**

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You should rely only on the information contained in this prospectus. We have not, and the underwriters have not, authorized anyone to provide you with additional information or information different from that contained in this prospectus. We are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of our common stock.

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In this prospectus, references to "dollar" or "$" are to the legal currency of the United States, and references to "euro" or "€" are to the single currency introduced on January 1, 1999 at the start of the third stage of European Economic and Monetary Union, pursuant to the Treaty establishing the European Communities, as amended by the Treaty on European Union and the Treaty of Amsterdam. Unless otherwise indicated, the financial information in this prospectus has been expressed in U.S. dollars. Unless otherwise stated, the U.S. dollar equivalent information translating euros into U.S. dollars has been made, for convenience purposes, on the basis of the noon buying rate published by the Board of Governors of the Federal Reserve as of June 29, 2012, which was €1.00 = $1.2668. Such translations should not be construed as a representation that the euro has been, could have been or could be converted into U.S. dollars at the rate indicated, any particular rate or at all.

All trademarks appearing in this prospectus are the property of their respective holders.

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Prospectus summary

This summary highlights information contained elsewhere in this prospectus and does not contain all of the information that you should consider before you decide to invest in our common stock. Investing in our common stock involves a high degree of risk. You should carefully read this entire prospectus, including our financial statements and the related notes included in this prospectus and the information set forth under the headings "Risk factors" and "Management's discussion and analysis of financial condition and results of operations."

Unless the context requires otherwise, the terms "Radius," "Company," "we," "us" and "our" refer to Radius Health, Inc. (f/k/a MPM Acquisition Corp.). See " Our Corporate Information."

OUR BUSINESS

We are a biopharmaceutical company focused on developing new therapeutics for the treatment of osteoporosis and other women's health conditions. Our lead product candidate is BA058, a novel synthetic peptide analog of human parathyroid hormone-related protein, or hPTHrP, a naturally-occurring bone building hormone. We are developing BA058 as a treatment for osteoporosis in both injection (with BA058-SC, a subcutaneous injection currently in a Phase 3 clinical study) and transdermal (with BA058-TD, a short wear-time, transdermal patch currently in a Phase 2 clinical study) methods of administration. Osteoporosis is a disease characterized by low bone mass and structural deterioration of bone tissue, which can lead to an increase in fractures. We believe that BA058 stimulates the rapid formation of new, high-quality bone in patients suffering from osteoporosis and may restore bone mineral density, or BMD, in these patients into the normal reference range.

OUR MARKET OPPORTUNITY

The National Osteoporosis Foundation, or the NOF, has estimated that 10 million people in the United States, comprising eight million women and two million men, have osteoporosis, and another 34 million have low bone mass placing them at increased risk for osteoporosis. In addition, the NOF has estimated that osteoporosis was responsible for more than two million fractures in the United States in 2005 resulting in an estimated $19 billion in costs. The NOF expects that the number of fractures due to osteoporosis will rise to three million by 2025. Worldwide, osteoporosis affects an estimated 200 million women according to the International Osteoporosis Foundation, or the IOF. The IOF has also estimated that 1.6 million hip fractures occur worldwide each year, and by 2050 this number could reach between 4.5 and 6.3 million.

There are two main types of osteoporosis drugs currently available, anti-resorptive agents and anabolic agents. According to industry sources, sales of these drugs in the United States, the five major markets in Europe and Japan exceeded $6 billion in 2011. Anti-resorptive agents act to prevent further bone loss by inhibiting the breakdown of bone, whereas anabolic agents stimulate bone formation to build new, high-quality bone. We believe there is a large unmet need in the market for osteoporosis treatment because existing therapies have shortcomings in efficacy, tolerability and convenience. For example, the current standard of care, bisphosphonates, an anti-resorptive agent, has been associated with infrequent but serious adverse events such as osteonecrosis of the jaw, atrial fibrillation and anomalous fractures, especially of long bones, resulting from "frozen bone." Accordingly, we believe that there is a significant opportunity for a new therapeutic such as BA058, an anabolic agent, that will increase BMD to a greater degree and at a faster rate than other approved drugs for the treatment of osteoporosis with added advantages in convenience and safety.

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OUR PRODUCT CANDIDATES

In August 2009, we announced positive Phase 2 data which showed that BA058-SC produced faster and greater BMD increases at the spine and the hip with substantially less hypercalcemia than Forteo, the only approved anabolic agent for the treatment of osteoporosis in the United States. Specifically, our study demonstrated that total analyzable hip BMD showed a more than five-fold benefit of BA058 at a dose of 80 µg over Forteo after six months, and BA058 at a dose of 80 µg increased mean lumbar spine BMD by 6.7% at six months, compared to 5.5% with Forteo, and by 12.9% at 12 months, compared to 8.6% with Forteo. In April 2011, we began dosing patients in a pivotal, multinational Phase 3 study designed to show that BA058-SC prevents new vertebral fracture compared to placebo. We expect to report top-line 18-month fracture data from this Phase 3 study in the fourth quarter of 2014. We believe that BA058 has the following potential advantages over the current standard of care:

- greater efficacy;
- faster benefit for building bone;
- shorter treatment duration;
- less hypercalcemia;
- no additional safety risks; and
- no refrigeration required in use.

We are also developing BA058-TD, a short wear time, transdermal form of BA058 that is delivered using a patented microneedle patch technology from 3M Drug Delivery Systems, or 3M. We commenced a Phase 2 clinical study of BA058-TD in the third quarter of 2012, and expect top-line data from this study to be available in the third quarter of 2013. We believe BA058-TD may eliminate the need for daily injections, lead to better treatment compliance for patients and expand the existing market. We reported the following top-line results from a Phase 1b study in December 2011:

- rapid release of BA058 from the microneedle patch;
- peak transdermal drug levels consistent with BA058-SC;
- faster time to peak concentration, and faster elimination in plasma, compared to BA058-SC;
- increase in the bone-formation marker P1NP in serum after seven days of exposure, consistent with bone-building activity; and
- identification of optimal wear time of five minutes or less, and effective sites of application.

We are also developing RAD1901, a selective estrogen receptor modulator, or SERM, for the treatment of vasomotor symptoms, commonly known as hot flashes, in women entering menopause, and RAD140, a selective androgen receptor modulator, or SARM, which is an orally active androgen agonist on muscle and bone and is a potential treatment for age-related muscle loss, frailty, weight loss associated with cancer, cachexia and osteoporosis.

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OUR STRATEGY

We plan to build a biopharmaceutical company focused on developing new therapeutics for osteoporosis and other women's health conditions by:

- completing the pivotal Phase 3 study of BA058-SC for the treatment of osteoporosis and reporting top-line 18-month fracture data in the fourth quarter of 2014;
- pursuing the clinical development of BA058-TD as a follow-on product for the treatment of osteoporosis;
- seeking regulatory approval of BA058-SC and BA058-TD for the treatment of osteoporosis if the clinical trials for these product candidates are successful, initially in the United States and subsequently in Europe;
- potentially collaborating with third parties for the worldwide commercialization of BA058 (except Japan);
- pursuing the potential application of BA058 in the moderate osteoporosis market as well as for the treatment of osteoarthritis;
- potentially collaborating with third parties for the further development and commercialization of RAD1901 and RAD140 on a worldwide basis; and
- building a strong management team and board of directors with significant pharmaceutical development, regulatory and commercial experience.

RISK FACTORS

Investing in our common stock involves a high degree of risk. These risks are discussed more fully in the "Risk factors" section of this prospectus. In particular, these risks include:

- We have a short operating history. We currently have no commercial products, and we have not received regulatory approval for, nor have we generated commercial revenue from, any of our product candidates. If we do not obtain the necessary United States or worldwide regulatory approvals to commercialize any product candidate, we will not be able to sell our product candidates.
- Most of our product candidates are in early stages of clinical trials. We cannot predict with any certainty if or when we might submit a New Drug Application, or NDA, for regulatory approval for any of our product candidates or whether any such NDA will be accepted.
- We have a history of net losses and expect to incur substantial losses and negative operating cash flow for the foreseeable future, and may never achieve or maintain profitability.
- We are heavily dependent on the success of BA058-SC, and BA058-TD as a follow-on product, both of which are under clinical development. We cannot be certain that BA058-SC or BA058-TD will receive regulatory approval or be successfully commercialized even if we receive regulatory approval.
- Clinical trials of our product candidates may not be successful. If we are unable to obtain required marketing approvals for, commercialize, obtain and maintain patent protection for or gain sufficient market acceptance by physicians, patients and healthcare payers of our product candidates, or experience significant delays in doing so, our business will be materially harmed and our ability to generate revenue will be materially impaired.

OUR CORPORATE INFORMATION

We were incorporated in Delaware on February 4, 2008 under the name MPM Acquisition Corp. In May 2011, we entered into a reverse merger transaction, or the Merger, with our predecessor, Radius Health, Inc., a Delaware corporation formed on October 3, 2003, or the Former Operating Company. Pursuant to the Merger, the Former Operating Company became a wholly-owned subsidiary of ours.

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Immediately following the Merger, we merged the Former Operating Company with and into us, and we assumed the business of the Former Operating Company and changed our name to "Radius Health, Inc."

As of June 30, 2012, we employed thirteen full-time employees and two part-time employees, three of whom held Ph.D. or M.D. degrees. Nine of our employees were engaged in research and development activities and six were engaged in support administration and finance. We intend to use clinical research organizations, or CROs, and third parties to perform our clinical studies and manufacturing.

Our executive offices are located at 201 Broadway, 6th Floor, Cambridge, MA 02139. Our telephone number is (617) 551-4700.

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The offering

Common stock offered by us	6,500,000 shares
Common stock to be outstanding after the offering	29,749,417 shares
Over-allotment option	We have granted the underwriters a 30-day option to purchase up to an additional 975,000 shares to cover over-allotments.
Use of proceeds	We estimate that our net proceeds from this offering will be approximately $55.8 million at an assumed public offering price of $9.50 per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We expect to use the net proceeds of this offering to fund the clinical development of our most advanced product candidates and for other general corporate purposes.
Risk factors	See "Risk factors" beginning on page 10 of this prospectus for a discussion of factors you should carefully consider before you decide to invest in our common stock.
Proposed NASDAQ Global Market symbol	RDUS

The number of shares of our common stock outstanding after this offering is based on the 855,116 shares of our common stock outstanding as of June 30, 2012 and excludes:

- 3,937,386 shares of our common stock issuable upon the exercise of outstanding stock options at a weighted average exercise price of $3.10 per share;
- 803,032 shares of our common stock reserved for future issuance under our 2011 equity incentive plan;
- 147,606 shares of our common stock issuable upon the exercise of outstanding warrants at a weighted average exercise price of $8.15 per share; and
- 2,448,340 shares of our common stock reserved for issuance in satisfaction of dividends accrued as of June 30, 2012 on our shares of series A-5 convertible preferred stock, which may be issued at any time following the listing of our common stock on the NASDAQ Global Market, and additional shares that will accrue quarterly based on the progress of certain preclinical and clinical trials conducted for us by Nordic Bioscience Clinical Development VII A/S, or Nordic, the holder of our series A-5 convertible preferred stock, and are issuable at a price per share equal to the greater of (1) $8.142 or (2) the 20-day average closing trading price of our common stock as of two days prior to the date of accrual.

Except as otherwise indicated, all information in this prospectus reflects or assumes the following:

- the automatic conversion of all outstanding shares of our convertible preferred stock into 20,754,880 shares of our common stock upon the listing of our common stock on the NASDAQ Global Market;
- the issuance of 1,639,421 shares of our common stock to the holders of our series A-1, A-2 and A-3 convertible preferred stock upon the listing of our common stock on the NASDAQ Global Market in satisfaction of accumulated dividends, as required by the terms of the series A-1, A-2 and A-3 convertible preferred stock, assuming for this purpose that the listing of our common

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stock on the NASDAQ Global Market occurred on June 30, 2012, all of which is described more fully under the section of this prospectus entitled "Capitalization";

- the amendment and restatement of our certificate of incorporation and the amendment and restatement of our bylaws upon the listing of our common stock on the NASDAQ Global Market;
- the increase in the number of shares of our common stock reserved for future issuance under our amended 2011 equity incentive plan, which will become effective upon the listing of our common stock on the NASDAQ Global Market;
- no issuance of the dividends accrued on our series A-5 convertible preferred stock described above;
- no exercise of the outstanding options or warrants described above; and
- no exercise of the underwriters' option to purchase up to an additional 975,000 shares of our common stock to cover over-allotments.

Certain of our existing stockholders and their affiliated entities have indicated an interest in purchasing an aggregate of up to approximately $14 million in shares of our common stock in this offering at the initial public offering price. Assuming an initial public offering price of $9.50 per share, which is the midpoint of the price range listed on the cover page of this prospectus, these stockholders would purchase an aggregate of up to approximately 1,500,000 of the 6,500,000 shares in this offering based on these indications of interest. However, because indications of interest are not binding agreements or commitments to purchase, these stockholders may determine to purchase fewer shares than they indicate an interest in purchasing or not to purchase any shares in this offering. In addition, the underwriters could determine to sell fewer shares to these stockholders than the stockholders indicate an interest in purchasing or not to sell any shares to these stockholders.

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Summary financial data

You should read the following summary financial data in conjunction with "Selected financial data," "Management's discussion and analysis of financial condition and results of operations" and our financial statements and related notes, all included elsewhere in this prospectus.

We derived the statements of operations data for the years ended December 31, 2009, 2010 and 2011 and the balance sheet data as of December 31, 2011 from our audited financial statements included elsewhere in this prospectus. We derived the statement of operations data for the six months ended June 30, 2011 and 2012 and the balance sheet data as of June 30, 2012 from our unaudited financial statements for period ended June 30, 2012 included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results to be expected in the future.

SEC rules require that the most recently filed annual financial statements be recast in this prospectus to reflect any subsequent changes in accounting principles or presentation that are being applied retrospectively. As a result, we have recast certain financial information presented in our Annual Report on Form 10-K to reflect the adoption of Accounting Standards Update No. 2011-05, *Presentation of Comprehensive Income*. These changes were previously reflected in our most recent quarterly report on Form 10-Q. Except as related to the matters that have led to the recast financial information presented herein, the disclosures contained in our Annual Report on Form 10-K have not otherwise been updated from those disclosures contained in our 2011 Form 10-K.

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Statements of Operations and Comprehensive Loss Data:	Years ended December 31, 2011	2010	2009	Six months ended June 30, 2012	2011
	(in thousands, except share and per share amounts)				
Revenue:					
Option fee revenue	$	$	$ 1,616	$	$
Operating expenses:					
Research and development	36,179	11,692	14,519	24,366	20,689
General and administrative	5,330	3,630	2,668	4,291	1,842
Restructuring		217			
Loss from operations	(41,509)	(15,539)	(15,571)	(28,657)	(22,531)
Other income (expense), net	(236)	824	(7)	(1,184)	22
Interest income (expense), net	(731)	85	489	(992)	(88)
Net loss	$ (42,476)	$ (14,630)	$ (15,089)	$ (30,833)	$ (22,597)
Other comprehensive loss, net of tax:					
Unrealized gain (loss) from available-for-sale securities	8	(18)	(232)	5	3
Comprehensive loss	$ (42,468)	$ (14,648)	$ (15,321)	$ (30,828)	$ (22,594)
Earnings (loss) attributable to common stockholders basic and diluted	$ 253	$ (26,773)	$ (26,494)	$ (37,643)	$ 1,013
Earnings (loss) per share basic	$ 0.51	$ (83.42)	$ (82.68)	$ (46.18)	$ 2.51
Earnings (loss) per share diluted	$ 0.07	$ (83.42)	$ (82.68)	$ (46.18)	$ 0.27
Weighted average shares basic	499,944	320,942	320,424	815,053	403,967
Weighted average shares diluted	3,454,276	320,942	320,424	815,053	3,790,913
Pro forma earnings (loss) attributable to common stockholders basic and diluted[1][2] (unaudited)	$ 18,461			$ (30,833)	
Pro forma earnings (loss) per share basic[1] (unaudited)	$ 1.24			$ (1.38)	
Pro forma earnings (loss) per share diluted[1] (unaudited)	$ 1.17			$ (1.38)	
Weighted-average common shares used in computing pro forma earnings per share basic[3] (unaudited)	14,848,565			22,373,458	
Weighted-average common shares used in computing pro forma earnings per share diluted[3] (unaudited)	15,753,387			22,373,458	

(1) *Unaudited pro forma basic and diluted earnings attributable to common stockholders and pro forma basic and diluted earnings per share are calculated after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock into shares of common stock, as if these conversions occurred at the beginning of the respective period, or their original issuance date, if later.*

(2) *Unaudited pro forma basic and diluted earnings attributable to common stockholders for the year ended December 31, 2011, is comprised of net loss and extinguishment of preferred stock, which are both included in basic and diluted earnings attributable to common stockholders. See Note 5, "Net loss per share," to our financial statements for the year ended December 31, 2011. Unaudited pro forma basic and diluted earnings attributable to common stockholders for the six months ended June 30, 2012 comprises net loss. See Note 4, "Net Income (Loss) Per Share," to our financial statements for the period ended June 30, 2012. Unaudited pro forma basic and diluted earnings, calculated using the if-converted method, excludes accretion of preferred stock and earnings attributable to participating preferred stockholders.*

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(3)

Unaudited basic and diluted weighted-average common shares used in computing pro forma earnings per share for the year ended December 31, 2011 are calculated assuming that the Former Operating Company's Series A, B and C convertible preferred stock was exchanged for our series A-2, A-3 and A-4 convertible preferred stock at the beginning of the respective period, that our series A-2, A-3 and A-4 convertible preferred stock was outstanding for the entire respective period and that the Former Operating Company's series A, B and C convertible preferred stock was not outstanding for any portion of the respective period. See Note 4, "Recapitalization," to our financial statements for the year ended December 31, 2011.

	As of June 30, 2012		
			Pro forma
Balance Sheet Data:	**Actual**	**Pro forma(1)**	**as adjusted(1)(2)(4)**