COMPANY NOTE

Estimate Change

USA | Healthcare | Biotechnology

November 7, 2014

Jefferies

Price target \$48.00 Price \$8.14

Dicerna Pharmaceuticals (DRNA) **3Q14 Update – Critical Clinical Pipeline Data** On Track For 2015

Key Takeaway

During its 3Q call, DRNA reiterated its focus on the 2015 initiation of Phase 1 clinical trials for both DCR-PH1 and DCR-MYC with topline data for both expected by year end 2015. We believe DRNA has adequate cash to fund operations through these key data readouts and maintain our \$48 price target.

We Continue To Expect DCR-PH1 Data In 2015. With the Phase 1 trial expected to begin in 2015, we continue to expect a 50% reduction in urinary oxalate to be an acceptable endpoint for approval, based on expert commentary at the International Primary Hyperoxaluria Workshop in June. We expect proof-of-concept results by 2H15. DRNA held an advisory board meeting with thought leaders who made it clear that reduction in oxalate levels would be beneficial for all genotypes.

DRNA Addresses ALNY Competition. On its call, DRNA addressed Alnylam's (ALNY, NC) recently presented RNAi-based therapeutic program for PH1. As a reminder, in addition the DCR-PH1 presentation at the Olifonucleotide Therapeutics Society meeting in October, ALNY presented rodent data for its ALN-GO1, an ESC-GalNAc conjugate siRNA that targets glycolate oxidase (GO) that was shown to decrease urinary oxalate >70%. ALNY will identify an ALN-GO1 candidate in mid-2015 and file with the FDA to being trials in 2016, giving DRNA roughly a year lead. Nevertheless, we see this fast-follower as a potentially legitimate threat, given ALNY's track record and subcutaneous administration. Separately on the competitive front, we are looking for Oxthera's Oxabact to have data in December, but expect DCR-PH1 to show better efficacy.

DCR-MYC Program On Track. The first dose-finding Phase 1 trial in solid tumors, multiple myeloma, and lymphomas began in April, and DRNA noted that they were pleased with the enrollment. Having escalated through many doses, the company notes it has yet to hit a maximum tolerated dose (MTD), which along with determining pharmacokinetics and antitumor activity of DCR-MYC, is the goal of the trial. DRNA still expects topline data by 2H15. A Phase 1 trial in advanced hepatocellular carcinoma (HCC) is still expected to begin in Asia in 2H14. Given its stage of development, we view this program as high risk.

Financials. DRNA reiterated its expectation that to have sufficient cash to fund operations through 2016. As of September, DRNA had a cash position of \$112m.

Valuation/Risks

We derive our \$48 price target on a DCF based sum-of-parts valuation. Risks include: clinical, regulatory, and commercial.

| USD | Prev. | 2014E | Prev. | 2015E | Prev. | 2016E | Prev. | 2017E |
|-----------|--------|---------|-------|--------|-------|-------|-------|-------|
| Rev. (MM) | | 0.0 | | 0.0 | | | | |
| EPS | | | : | | | | 1 | |
| Mar | | (0.56)A | | | | | | |
| Jun | | (0.51)A | | | | | | |
| Sep | (0.53) | (0.54)A | | | | | | |
| Dec | | (0.56) | | | | | | |
| FY Dec | (2.15) | (2.16) | | (2.48) | | | | |
| FY P/E | | NM | | NM | | | | |

Limited historical data due to recent company IPO

| Financial Summary | |
|---------------------------|------------------|
| Net Debt (MM): | (\$111.9) |
| Cash (MM): | \$111.9 |
| Market Data | |
| 52 Week Range: | \$46.00 - \$8.00 |
| Total Entprs. Value (MM): | \$30.6 |
| Market Cap. (MM): | \$142.5 |
| Insider Ownership: | 43.3% |
| Institutional Ownership: | 38.3% |
| Shares Out. (MM): | 17.5 |
| Float (MM): | 8.8 |
| Avg. Daily Vol.: | 171,411 |
| | |

Thomas Wei *

Equity Analyst (212) 284-2326 twei@jefferies.com

Timothy Chou *

Equity Associate (212) 284-2571 tchou@jefferies.com

Shaunak Deepak *

Equity Analyst (212) 284-2020 sdeepak@jefferies.com

Rebecca Forest *

Equity Associate (212) 284-2170 rforest@jefferies.com * Jefferies LLC

Price Performance



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DRNA: Historical and Projected Revenue and Earnings

| December 31 Fiscal Year (\$000s, except per share) | 2012 | 2013 | 1Q14A | 2Q14A | 3Q14A | 4Q14E | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|------------|-------------|--------------|-----------|---|----------|----------|----------|----------|---------|----------|---------|---------|----------|-----------|
| - 11 1 | | | | | | | | | | | | | | | |
| End User Sales | | _ | _ | _ | _ | _ | _ | _ | _ | | | | | | |
| U.S. PH1.Sales | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,581 | 63,225 | 106,783 | 154,514 | 201,448 | 245,079 |
| Ex-U.S. PH1.Sales | | 0 | 0 | О | 0 | 0 | 0 | 0 | 0 | 22,073 | 89,895 | 155,040 | 224,326 | 293,117 | 355,972 |
| WWPH1 Sales | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37,654 | 153,120 | 261,823 | 378,840 | 494,565 | 601,051 |
| WWDCR-MI711 Sales | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66,150 | 667,229 | 1,829,961 |
| Dicema Reported Revenue | | | | | | | | | | | | | | | |
| U.S. PHI Sales | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | О | 15,581 | 63,225 | 106,783 | 154,514 | 201,448 | 245,079 |
| Ex-U.S. PH1 Royalties | | О | 0 | 0 | О | 0 | 0 | О | О | 4,415 | 19,974 | 36,512 | 57,298 | 77,935 | 96,792 |
| DCR-MI711 Royalties | | 0 | 0 | 0 | 0 | 0 | 0 | О | 0 | . 0 | 0 | 9,922 | 100,084 | 274,494 | 451,193 |
| Mlestones | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000 | 125,000 | 25,000 | 25,000 | 125,000 | 75,000 | 75,000 |
| Other Revenue | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | ŭ | Ü | Ü | Ü | Ŭ | Ü | | | Ŭ | ŭ | Ŭ | ŭ | Ŭ | Ü |
| Revenue | 7,015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000 | 144,996 | 108,199 | 178,217 | 436,897 | 628,877 | 868,063 |
| | | | | | | | | | | | | | | | |
| Operating expenses: | | | | | | | | | | | | | J | | l |
| 0002 | 0 | О | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,558 | 5,058 | 7,475 | 10,816 | 14,101 | 17,156 |
| % of Product Sales | NM | NΜ | NM | NM | NM | NM | NM | | NΜ | 10% | 8% | 7% | 7% | 7% | 7% |
| Research and Development | 11,551 | 11,434 | 3,525 | 5,920 | 6,763 | 7,000 | 23,208 | | 50,000 | 62,000 | 68,200 | 75,020 | 90,024 | 108,029 | 129,635 |
| % of Revenue | NM | NM | NM | NM | NM | NM | NM | | NM | 43% | 63% | 42% | 21% | 17% | 15% |
| SG&A | 4,589 | 5,449 | 2,355 | 2,853 | 2,844 | 3,100 | 11,152 | | 18,000 | 31,000 | 38,000 | 41,000 | 44,300 | 47,115 | 49,021 |
| %cf Revenue | NM | NM | NM | NM | NM | NM | NM | NM | NM | 21% | 35% | 23% | 10% | 7% | 6% |
| Total Operating Expenses | 16,265 | 16,883 | 5,880 | 8,773 | 9,607 | 10,100 | 34,360 | 49,000 | 68,000 | 94,558 | 111,258 | 123,495 | 145,140 | 169,245 | 195,811 |
| Income (Loss) from operations | (9,250) | (16,883) | (5,880) | (8,773) | (9,607) | (10,100) | (34,360) | (49,000) | (18,000) | 50,438 | (3,059) | 54,722 | 291,757 | 459,632 | 672,253 |
| | | | | | | | | | | | | | | | |
| Other income (expense): | | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ |
| Preferred stock warrant remeasurement | 469 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| Interest income | 2 | 0 | 0 | 0 | 21 | 134 | 155 | 480 | 490 | 640 | 731 | 831 | 1,395 | 2,544 | 4,293 |
| Loss on extinguishment of debt | | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | О | 0 |
| Interest expense | (1,342) | (1,140) | (153) | (177) | 0 | 0 | (330) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total other income (expense) | (871) | (1,140) | (153) | (177) | 21 | 134 | (175) | 480 | 490 | 640 | 731 | 831 | 1,395 | 2,545 | 4,295 |
| Pre-tax income | (10,121) | (18,023) | (6,033) | (8,950) | (9,586) | (9,966) | (34,535) | (48,520) | (17,510) | 51,077 | (2,328) | 55,554 | 293,152 | 462,177 | 676,548 |
| | ` ' ' | ` -,, | .,, | .,, | .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | .,, | (- ,, | , ,, , | , , , , | - ,- | () | | | - 1 | |
| Tax | 0 | 0 | 0 | 0 | 0 | 0 | 0 | О | 0 | 18,899 | 0 | 20,555 | 108,466 | 171,006 | 250,323 |
| Tax rate | | | | | | | | | | 37% | 0% | 37% | 37% | 37% | 37% |
| Less: Accretion and dividends on redeemable convertible preferred stock | (4,097) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Net loss | (14,218) | (18,023) | (6,033) | (8,950) | (9,586) | (9,966) | (34,535) | (48,520) | (17,510) | 32,179 | (2,328) | 34,999 | 184,685 | 291,172 | 426,225 |
| | ¢ (545.00) | A (C14 TO | 4 (0.00.4 | (0 m) 6 | (05# A | (0.50 | 4 5245 | A 12 m | A (0.77) | | å (0.00) | | 4 -m | | 4 |
| Non-GAAP EPS | | \$ (611.72) | \$ (0.56) \$ | (0.51) \$ | (0.54) \$ | (0.56) | | | | \$ 134 | | | | \$ 10.69 | |
| Pro forma weighted average shares outstanding | 28 | 29 | 10,822 | 17,685 | 17,707 | 17,757 | 15,993 | 19,553 | 22,378 | 24,003 | 24,678 | 25,428 | 26,278 | 27,228 | 28,280 |

Source: Company data, Jefferies Group LLC estimate

11/6/2014

Estimate Change

November 7, 2014

DRNA: Historical and Projected Changes in Financial Position

| December 31 Fiscal Year (\$000s, except per share) | 2012A | 2013A | 2014E | 201 <i>5</i> E | 201 <i>6</i> E | 201 <i>T</i> E | 2018E | 2019E | 2020E | 2021E | 2022E |
|--|----------|----------|----------|----------------|----------------|-----------------|---------|---------|---------|------------------|-----------|
| | | | | | | | | | | | |
| CASH FLOWS FROM OPERATING ACTIVITIES: | | | | | | | | | | | |
| Net loss | (10,121) | (18,023) | (34,535) | (48,520) | (17,510) | 32,1 <i>7</i> 9 | (2,328) | 34,999 | 184,685 | 291,1 <i>7</i> 2 | 426,225 |
| Adjustments to reconcile net loss to net cash used in operating acti | | | | | | | | | | | |
| Deferred revenue | (1,014) | | | | | | | | | | |
| Deprediation | 551 | 523 | 575 | 632 | <i>6</i> 96 | 765 | 842 | 926 | 1,019 | 1,120 | 1,232 |
| Stock-based compensation | | 495 | | | | | | | | | |
| Loss on extinguishment of debt | - | 318 | | | | | | | | | |
| Non-cashinterest expense | - | | | | | | | | | | |
| Amortization of debt discount | 201 | 193 | | | | | | | | | |
| Amortization of debt issuance costs | 24 | 24 | | | | | | | | | |
| Utilization of NOL Carryforwards | | | - | - | - | 18,899 | - | 20,555 | - | - | - |
| Decrease in fair value of preferred stock warrant | (469) | (126) | | | | | | | | | |
| Changes in operating assets and liabilities: | | | | | | | | | | | |
| Research and license receivable | (4,857) | 5,018 | - | - | - | - | - | - | - | - | - |
| Prepaid expenses and other current assets | 28 | 57 | | | | | | | | | |
| Accounts payable | (216) | 116 | | | | | | | | | |
| Accrued expenses and other current liabilities | 49 | 1,016 | | | | | | | | | |
| Deferred rent | (38) | (60) | | | | | | | | | |
| Net cash used in operating activities | (15,737) | (10,449) | (33,960) | (47,888) | (16,814) | 51,843 | (1,486) | 56,479 | 185,704 | 292,292 | 427,458 |
| CASH FLOWS FROM INVESTING ACTIVITIES— | | | | | | | | | | | |
| Purchases of property and equipment | (120) | (413) | (496) | (595) | (5,947) | (6,542) | (7,196) | (7,916) | (8,707) | (9,578) | (10,536) |
| Net cash used in investing activities | (120) | (413) | (496) | (595) | (5,947) | (6,542) | (7,196) | (7,916) | (8,707) | (9,578) | (10,536) |
| CASH FLOWS FROM FINANCING ACTIVITIES: | | | | | | | | | | | |
| Proceeds from issuance of common stock | 7 | 46 | 92,955 | 38,775 | 37,224 | - | - | - | - | - | |
| Repurchase of restricted common stock | - | (5) | | | | | | | | | |
| Payments of deferred issuance costs | - | (1,399) | | | | | | | | | |
| Proceeds from issuance of redeemable convertible preferred stock | - | 57,000 | | | | | | | | | |
| Redeemable convertible preferred stock issuance costs | - | (220) | | | | | | | | | |
| Proceeds from long-term debt | - | - | | | | | | | | | |
| Proceeds from bridge loan financing | - | 3,000 | | | | | | | | | |
| Payments of long-term debt issuance costs | - | - | | | | | | | | | |
| Payments of long-term debt fees | (136) | - | | | | | | | | | |
| Repayments of long-term debt principal | (2,834) | (4,140) | (4,587) | (439) | | | | | | | |
| Net cash provided by (used in) financing activities | (2,963) | 54,282 | 88,368 | 38,336 | 37,224 | - | - | - | - | - | - |
| INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS | (18,820) | 43,420 | 53,912 | (10,147) | 14,463 | 45,301 | (8,682) | 48,564 | 176,997 | 282,714 | 416,922 |
| CASH AND CASH EQUIVALENTS—Beginning of period | 22,490 | 3,670 | 47,090 | 101,002 | 90,855 | 105,318 | 150,619 | 141,936 | 190,500 | 367,497 | 650,211 |
| CASH AND CASH EQUIVALENTS—End of period | 3,670 | 47,090 | 101,002 | 90,855 | 105,318 | 150,619 | 141,936 | 190,500 | 367,497 | 650,211 | 1,067,133 |

Source: Company data, Jefferies Group LLC estimate

November 6, 2014

Estimate Change

November 7, 2014

DRNA: Historical Condensed Balance Sheets

| (\$000s) | 9/30/2013 | 12/31/2013 | 3/31/2014 | 6/30/2014 | 9/30/2014 |
|--|-----------|------------|-----------|-----------|-----------|
| ASSETS | | | | | |
| CURRENT ASSETS: | | | | | |
| Cash and cash equivalents | 54,712 | 46,595 | 133,792 | 77,732 | 31,815 |
| Held-to-maturity investments | | | | 22,526 | 80,089 |
| Research and license agreement receivable | - | - | - | - | |
| Prepaid expenses and other current assets | 413 | 2,058 | 906 | 1,016 | |
| otal current assets | 55,125 | 48,653 | 134,698 | 101,274 | 111,904 |
| IONOURRENT ASSETS: | | | | | |
| Property and equipment-net | 683 | 877 | 911 | 1,473 | |
| Held-to-maturity investments | | | | 20,026 | |
| Restricted cash | 264 | 264 | 264 | 1,380 | |
| Other assets | | _ | - | - | |
| Total noncurrent assets | 947 | 1,141 | 1,175 | 22,879 | - |
| TOTAL ASSETS | 56,072 | 49,794 | 135,873 | 124,153 | 116,032 |
| LIABILITIES AND STOCKHOLDERS' EQUITY | | | | | |
| CURRENT LIABILITIES: | | | | | |
| Accounts payable | 1,557 | 1,700 | 715 | 1,062 | |
| Current portion of long-term debt | 4,471 | 4,587 | 3,785 | - | |
| Deferred revenue | - | - | - | - | |
| Deferred rent | 14 | 105 | 96 | 88 | |
| Accrued expenses and other current liabilities | 518 | 1,286 | 1,947 | 2,808 | |
| otal current liabilities | 6,560 | 7,678 | 6,543 | 3,958 | - |
| NONCURRENT LIABILITIES: | | | | | |
| Long-term debt-net of current portion | 1,407 | 260 | - | - | - |
| Preferred stock warrant liability | 436 | 529 | - | - | - |
| Deferred revenue-net of current portion | - | - | - | - | - |
| Deferred rent-net of current portion | | - | - | - | - |
| Total noncurrent liabilities | 1,843 | 789 | - | - | - |
| TOTALUABILITIES | 8,408 | 8,467 | 6,543 | 3,958 | 5,212 |
| otal stockholders' equity (deficit) | 47,669 | 41,327 | 129,330 | 120,195 | 110,820 |
| TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY | 56,072 | 49,794 | 135,873 | 124,153 | 116,032 |

Source: Company data, Jefferies Group LLC, Inc. estimates November 6, 2014

| DRNA |
|------------------|
| Estimate Change |
| November 7, 2014 |

Company Description

Dicerna Pharmaceuticals is a Watertown, MA-based therapeutics company focused on developing RNA interference (RNAi) technologies targeting liver and cancer. Dicerna has partnered two oncology development programs with the global pharmaceutical company Kyowa Hakko Kirin Co., Ltd. (KHK) targeting KRAS and CKAP5. DRNA's unpartnered programs are DCR-PH1 for Type 1 primary hyperoxaluria, a rare orphan disease resulting in renal failure, and DCR-M1711 targeting MYC for solid tumors.

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The expected total return (price appreciation plus yield) for Buy rated stocks with an average stock price consistently below \$10 is 20% or more within a 12-month period as these companies are typically more volatile than the overall stock market. For Hold rated stocks with an average stock price consistently below \$10, the expected total return (price appreciation plus yield) is plus or minus 20% within a 12-month period. For Underperform rated stocks with an average stock price consistently below \$10, the expected total return (price appreciation plus yield) is minus 20% within a 12-month period.

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<u>**Jefferies Franchise Picks**</u>

| DRNA |
|------------------|
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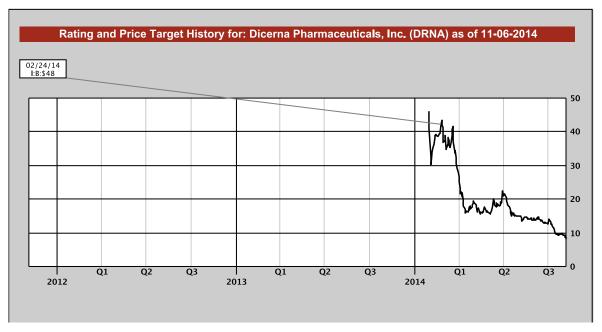
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Other Companies Mentioned in This Report

• Dicerna Pharmaceuticals, Inc. (DRNA: \$8.14, BUY)



Distribution of Ratings

| | | | IB Serv./Past 12 Mos. | | | |
|--------------|-------|---------|-----------------------|---------|--|--|
| Rating | Count | Percent | Count | Percent | | |
| BUY | 1009 | 52.06% | 264 | 26.16% | | |
| HOLD | 790 | 40.76% | 143 | 18.10% | | |
| UNDERPERFORM | 139 | 7.17% | 5 | 3.60% | | |

DRNA Estimate Change November 7, 2014

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Thomas Wei, Equity Analyst, (212) 284-2326, twei@jefferies.com

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